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INDEX

OF THE

Mycological Writings

—OF—

C. G. LLOYD.

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1905-1908.

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Mycological Notes, Old Series No. 1 and Polyporoid Issue No. 1 should not be included in this volume, but held for Vol. III.

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ABBREVIATIONS.

The following abbreviations are used in this Index:

Gea—The Geastrae (1902) Vol. I.

Gas—The Genera of Gastromycetes (1902) Vol. I.

Aus—The Lycoperdaceae of Australia and New Zealand (1905) Vol. I.

Tyl—The Tylostomeae (1906) Vol. II.

Nid—The Nidulariaceae (1906) Vol. II.

Aus. Ph.—The Phalloids of Australasia (1907) Vol. II.

Let.—Letters.

~~603 L77m v.2~~
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INDEX OF THE SPECIES OF GASTROMYCETES IN VOLS. I AND II.

NOTE.

As my principal publications to date have been on the Gastromycetes, it is thought advisable to issue a complete index of the species considered from the beginning. While not all Gastromycetes known to me have been published in Mycological Notes, by far the greater part of them have, and the following list includes almost all the species that I consider valid.

Those so closely related to others that they may perhaps better be called sub-species, varieties or even forms are indicated by a star (*). (See article on page 7 of Index of Vol. I.)

Plants are indicated in this index by the names I adopt for them now after a thorough study of the literature and specimens bearing on the conflicting nomenclature. In some instances my views have changed since I began working on the subject, and the plants have been published under names not now adopted. These are indicated by footnote references to the names under which they were published.

If the figures are in parenthesis it indicates that in this reference the plant was only partially considered.

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‡ Those species marked with a dagger (†) are very doubtful, and probably largely imaginary.

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NOTES.

1 As Drummondii (synonyn).

2 The account of Bovista tomentosa on page 118 and on Plate 4 is an error, the plant being a scurfy form of Bovista plumbea Likewise the name Bovista brunnea, used in Aus. 24 cfr. p. 392).

3 As Bovista.

4 As Morganii (synonym).

5 As fornicatus (error).

6 As delicatus (synonyn).

7 As fenestratus (synonym).

8 As tenuipes (synonym).

9 As lageniformis (synonym. Perhaps a slight difference might be made between saccatus and lageniformis.

10 As Drummondii (error).

11 As radicans (synonym).

12 Delilei (type form).

13 I should class Hypoblema now as a subgenus under Calvatia.

14 As Bovista lateritia, an error. The plate No. 4 is also so named by error.

15 I think now that the genus Lasiosphaera is better classed as a subgenus under Calvatia.

16 This plant was published as Lycoperdon serotinum on the supposed authority of Bonorden. It has since developed it is not Bonorden's plant. cfr. Myc Notes, p 201) As Rostkovius gave a good figure of the plant under the name Lycoperdon areolatum, I see no reason why this name should not be adopted. At the best, however, it is only a form of Lycoperdon piriforme.

17 Lycoperdon glabellum, which I have referred as a synonym of Lycoperdon umbrinum, I have since collected fresh at Albany, N. Y., and I consider it now a very distinct species.

18 I doubt very much the validity of Lycoperdon tephrum (cfr. Myc. Notes p. 249 .

19 As Ravenelii, var. minor.

20 I would now restrict the genus Mycenastrum to the original species, Mycenastrum Corium on its *peculiar* capillitium character. All other species so classed I would consider as a subgenus of Calvatia.

21 As spinulosum (synonym).

22 With cleavage of peridium.

23 As verrucosum, of which it can well be held to be a variety.

24 As melanocephalum (misprint).

25 As rubigenum (error).

26 Since Tylostoma similans was published, additional selections have convinced me it is not practicable to keep it distinct even as a variety.

27 As Anthurus. From examinations of dried specimens, I have heretofore thought that Lysurus borealis would prove the same as Gardneri of Ceylon. Recent observation of the fresh plant (Ceylon) has shown it quite different.

28 This "red" Lysurus also, I think, is probably a form of the above.

29 This plant was published as Phallus merulinus, but merulinus having since been ascertained to be another species, it must take the name proposed for it by Professor McGinty, in keeping with the rules. The name Rochesterensis commemorates a little village in New York State where these celebrated rules, so dear to Professor McGinty, were promulgated.

30 As rubescens (synonym).

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INDEX TO SYNONYMS AND JUGGLED NAMES.

Index of synonyms and plants imperfectly described, imperfectly known, or based on imperfect material. Also juggled names. While no man's opinion is final on such things, in my opinion mycology would be much better off if this list did not exist. "Synonymy" is an author's trash pile where he dumps the names which in his opinion have no value. It is a sad commentary on the character of the work that has been done that about four-fifths of the names proposed finally reach the dump.

It does not follow that all the specific names in the following list are invalid species. Many of them are correct in other genera, and are placed here when wrongly classified generically.

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It is a question if there has been another subject on earth that has been as bunglingly worked as the subject of mycology. I attribute a great part of this to the prevailing system of adding an author's name to that of the plant. It serves only to gratify the vanity of writers who like to see their names in print, and results in a great deal of bad work. As I am not publishing an advertising paper, I have declined, in considering only plants, to insert these free advertisements. To atone for my failure in this regard, however, I am willing to devote a few pages in the indices of volumes to advertisements, and even to make them display advertisements.

A much more sensible thing than to write authors' names after plant names would be to write the country in which the plant grows, if it is necessary to write anything other than a binomial as a plant name. Where I am concerned in the following list, I have added only the country.

In making the list I give the advertisement to the author who proposed the specific name adopted. To put his name in parenthesis and add the name of the individual who shuffled it around to another genus is not only useless but exceedingly harmful in developing a class of generic name shifters, who work only with this object in view. To substitute for the first author the name of the second is purely a fraud.

I have written this list chiefly from memory, for I do not consider it of enough importance to put much labor on it, if it involved looking up the authorities. I think it is correct, but if there are any errors, they are mistakes of memory. I would not intentionally cheat any one out of his advertisement, so dear to the breasts of mycological writers in general.

In the following list, those plants so closely related to others that they are better called varieties or forms are indicated by a *. Species that are very doubtful and, probably largely imaginary, I have indicated with a †.

Arachnion album, **Schweinitz,** rufum, Australia—*Aseroe* Hookeri, **Berkeley,** lysurioides,† **Fischer,** Muelleriana, **Kalchbrenner,** pectactina, **Endlicher,** rubra, **La Billardiere**—*Battarrea*, Digueti,* **Patouillard,** Guicciardiniana,* **Cesati,** levispora,* **Massee,** phalloides, **Dickson,** Stevenii,* **Liboschitz**—*Battarreopsis* Artini, **Hennings**—*Blumenavia* rhacoides, **Moeller**—*Bovista* minor,* **Morgan,** nigrescens, **Persoon,** Pila, **Berkeley,** plumbea, **Persoon,** tomentosa, **Vittadini**—*Bovistella* ammophila, **Léveillé,** aspera, **Léveillé,** Australiana, Australia, bovistoides, **Cooke,** Davisii, Massachusetts, dealbata, Washington, Dominicensis, **Massee,** echinella, **Patouillard,** gemmatum, U. S., glabescens, **Berkeley,** Gunnii, **Berkeley,** Henningsii, India, Japonica, Japan, lycoperdoides, **Cooke,** Miyabei, Japan, Ohiensis, **Morgan,** paludosa, **Léveillé,** pedicellata, **Peck,** radicata,* **Montagne,** rosea,* Australia, scabra, Australia, trachyspora, India, yunnanensis, **Patouillard**—*Broomei* congregata, **Berkeley**—*Calvatia* caelata, **Bulliard,** candida, **Rostkovius,** craniiformis, **Schweinitz,** elata, **Massee,** Fontanesii,* **Montagne,** gigantea, **Batsch,** lateritia, **Massee,** lilacina, **Berkeley,** olivacea, **Cooke,** pachyderma, **Peck,** rubroflava, **Cragin,** saccata, **Fries,** sculpta, **Harkness**—*Castoreum* radicatum, **Cooke**—*Catastoma* anomalum, **Cooke,** circumscissum, **Berkeley,** hyalothrix, **Cooke,** hypogaeum, **Cooke,** Muelleri, **Berkeley,** pedicellatum, **Morgan,** subterraneum, **Peck**—*Cauloglossum* transversarium, **Bosc**—*Clathrus* cancellatus, **Bulliard,** chrysomycelinus, **Moeller,** cibarius, **Tulasne,** crispus, **Turpin,** delicatus, **Berkeley,** gracilis, **Berkeley,** pusillus, **Berkeley,** Treubii, **Bernard**—*Clavogaster* novo-zelandicus **Hennings**—*Colus* hirudinosus, **Montagne**—*Crucibulum* vulgare, **Tulasne**—*Cyathus* ambiguus, **Tulasne,** Anglicus,* England, Berkeleyanus, **Tulasne,** Canna, Barbados, Colensoi,

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Berkeley, dasypus, **Nees von Esenbeck,** Earlei, Cuba, Gayanus, **Tulasne,** Hookeri, **Berkeley,** intermedius, **Tulasne,** Lesueurii,* **Tulasne,** limbatus, **Tulasne,** microsporus, **Tulasne,** minimus, **Patouillard,** Montagnei, **Tulasne,** nigro-albus, Samoa, novae-zelandiae, **Tulasne,** pallidus, **Berkeley,** Poeppigii, **Tulasne,** pygmaeus, Washington, rufipes,* **Ellis,** sphaerosporus, Jamaica, Schweinitzii, **Tulasne,** stercoreus, **Schweinitz,** striatus, **Hudson,** triplex, Mauritius, vernicosus, **Bulliard**—*Cypellomyces* argentinensis, **Spegazzini**—*Dictyocephalos,* curvatus, **White**—*Diplocystis* Wrightii, **Berkeley**—*Gallacea* Scleroderma, **Cooke**—*Geaster* ambiguus, **Montagne,** Archeri, **Berkeley,** arenarius, Florida, asper, Micheli, Berkeleyi, **Massee,** Bryantii, **Berkeley,** caespitosus,* U. S., calceus,* South Africa, coronatus, **Schaeffer,** Drummondii, **Berkeley,** elegans, **Vittadini,** Englerianus,* **Hennings,** fimbriatus, **Fries,** floriformis, **Vittadini,** fornicatus, **Hudson,** giganteus,* U. S., Hariotii, Brazil, Hieronymii, **Hennings,** hygrometricus, **Persoon,** infrequens,* Europe, Javanicus, **Léveillé,** leptospermus,* **Atkinson,** limbatus, **Fries,** MacOwani,* **Kalchbrenner,** mammosus, **Chevallier,** minimus, **Schweinitz,** mirabilis, **Montagne,** pectinatus, **Persoon,** Peruvianus, **Cooke,** plicatus, **Berkeley,** Readeri,* **Berkeley,** rufescens, **Fries,** saccatus, **Fries,** Schmidelii, **Vittadini,** Scleroderma, **Montagne,** simulans, Australia, Smithii, Florida, squamosus,* Ceylon, stipitatus, **Fischer,** striatulus, **Kalchbrenner,** subiculosus,* **Cooke,** trichifer, **Rick,** triplex, **Junghuhn,** velutinus, **Morgan,** violaceus, **Rick,** vittatus,* **Kalchbrenner,** Welwitschii, **Montagne**—*Gymnoglossum* stipitatum, **Cooke**—*Gyrophragmium* decipiens,* **Peck,** Delilei, **Montagne,** inquinans,* **Berkeley,** Texense,* **Berkeley,**—*Holocotylon* Brandegeeanum, Mexico, Texense, Texas—*Hypoblema* lepidophorum, **Ellis**—*Itajahya* galericulata, **Moeller**—*Jansia* rugosa, **Penzig**—*Lanopila* bicolor, **Léveillé**—*Lasiosphaera* Fenzlii, **Reichardt**—*Laternea* bicolumnata, Japan, columnata, **Bosc,** Spegazzini, **McGinty**—*Lycoperdon* acuminatum, **Fries,** areolatum, **Rostkovius** cepaeforme, **Bulliard,** compressum,* U. S., coprophilum, **Massee,** cruciatum, **Rostkovius,** cupricolor,* Europe, cupricum, **Bonorden,** delicatum,* **Berkeley,** dermoxanthum,* **Vittadini,** Desmazieres,* Europe, dryinum,* **Morgan,** echinatum, **Persoon,** elegans, **Morgan,** elongatum,* **Berkeley,** excoriatum,* U. S., eximium,* **Morgan,** faveolum,* Michigan, floccossum,* U. S., fuligineum, **Berkeley,** fuscum,* **Bonorden,** gemmatum, **Batsch,** glabellum, **Peck,** Hoylei,* **Berkeley,** Hungaricum,* **Hollós,** macrogemmatum,* Europe, muscorum, **Morgan,** nigrescens, **Persoon,** nigrum,* Australia, oblongiosporum, **Berkeley,** piriforme, **Schaeffer,** polymorphum, **Vittadini,** polytrichum, U. S., pratense, **Persoon,** pseudogemmatum,* **Spegazzini,** pseudopusillum,* **Hollós,** pseudoradicans,* U. S., pulcherrimum, **Berkeley,** pusillum, **Batsch,** rimulatum, **Peck,** septimum, South America, spadiceum, **Persoon,** stellare,* **Peck,** stellatum, **Massee,** subincarnatum, **Peck,** subpratense,* U. S., subvelatum, Florida, tephrum, **Massee,** tessellatum,* **Persoon,** turbinatum,* Europe, Turneri, **Ellis,** umbrinum, **Persoon,** velatum, **Vittadini,** Wrightii, **Berkeley**—*Lysurus* australiensis, **Cooke,** borealis, **Burt,** Mokusin, **Cibot**—*Matula* poroniaeformis, **Berkeley**—*Mesophellia* arenaria, **Berkeley,** ingratissima, **Berkeley,** pachythrix,

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Cooke, sabulosa, **Cooke**—*Mitremyces* cinnabarinus, **Desvaux,** fuscus, **Berkeley,** insignis, **Berkeley,** Junghuhni, **Schlechtendal,** Le Rati, **Patouillard,** lucidus,* **Berkeley,** lutescens, **Schweinitz,** orirubra, **Cooke,** Ravenelii, **Berkeley,** Tylerii, Virginia—*Mutinus* annulatus,* **Bailey,** bambusinus, **Léveillé,** caninus, **Hudson,** curtus,† **Berkeley,** elegans, **Montagne,** papuasius,† **Kalchbrenner,** pentagonus, **Bailey,** Ravenelii, **Berkeley,** xylogenus, **Montagne**—*Mycenastrum* Corium, **Desvaux**—*Myriostoma* coliformis, **Dickson** *Nidula* candida, **Peck,** emodensis, **Berkeley,** granulifera, **Holmskjold,** microcarpa, **Peck**—*Nidularia* australis, **Tulasne,** Duriaeana, **Tulasne,** fusispora, **Massee,** Heribaudii, **Patouillard,** pisiformis, **Roth**—*Phallogaster* saccatus, **Morgan**—*Phallus* aurantiacus, **Montagne,** callichrous, **Moeller,** calyptratus,† **Berkeley,** daemonum, **Rumphius,** discolor,† **Kalchbrenner,** duplicatus, **Bosc,** glutinolens, **Moeller,** gracilis,* **Fischer,** imperialis,* **Kalchbrenner,** impudicus, **Linnaeus,** indusiatus, **Ventenat,** irpicinus, **Patouillard,** multicolor, **Berkeley,** quadricolor,† **Berkeley,** Ravenelii, **Berkeley,** retusus,† **Kalchbrenner,** Rochesterensis,* **McGinty,** roseus,* **Delile,** rubicundus, **Bosc,** rugulosus, **Fischer,** subacutus,* **Montagne,** tenuis, **Fischer**—*Podaxon* aegyptiacus, **Montagne,** Muelleri, **Hennings**—*Polysaccum* album,* **Massee,** Boudieri,* Corsica, confusum,* **Cooke,** crassipes,* **De Candolle,** pisocarpium, **Fries,** tuberosum,* **Fries** *Pseudocolus* Garciae, **Moeller,** Rothae, **Fischer**—*Queletia* mirabilis, **Fries**—*Schizostoma* laceratum, **Ehrenberg**—*Scleroderma* aurantium, **Bulliard,** Cepa, **Persoon,** flavidum, **Ellis,** Geaster, **Fries,** patens,* Mauritius, radicans,* Australia, tenerum,* **Berkeley,** Texense, **Berkeley,** venosum,* **Boudier,** verrucosum, **Bulliard**—*Secotium* acuminatum, **Montagne,** coarctatum, **Berkeley,** erythrocephalum, **Tulasne,** macrosporum, Texas, melanosporum, **Berkeley,** nubigenum,* **Harkness,** Olbium, **Tulasne,**‡ tenuipes, **Setchell**—*Simblum* gracile, **Berkeley,** periphragmoides, **Hooker,** sphaerocephalum, **Schlechtendal,** Texense, **Long**—*Sphaerobolus* stellatus, **Tode**—*Torrendia* pulchella, **Bresadola**—*Trichaster* melanocephalus **Czerniaiev**—*Tylostoma* albicans, **White,** Americanum, U. S., Australianum, Australia, Berkeleyi, U. S., Berteroanum, **Léveillé,** Bonianum, **Patouillard,** brevipes,* U. S., caespitosum, **Saccardo,** campestre, **Morgan,** cyclophorum, Africa, egranulosum, Australia, exasperatum, **Montagne,** floridanum, Florida, granulosum, **Léveillé,** Leveilleanum, **Léveillé,** Lloydii, **Bresadola,** Longii* Texas, McAlpinianum, Australia, montanum, **Patouillard,** Mussooriense, **Hennings,** obesum, **Berkeley,** occidentale, Washington, pallidum,* U. S., poculatum, **White,** pygmaeum, Florida, Readerii, Australia, Rickii, Brazil, rufum,* U. S., simulans,* U. S., subfuscum,* **White,** tuberculatum, **White,** verrucosum, **Morgan,** volvulatum, **Borsch**—*Whetstonia* strobiliformis, Minnesota.

MYCOLOGICAL NOTES

BY C. G. LLOYD

No. 19

CINCINNATI, O. MAY, 1905

THE GENUS LYCOPERDON IN EUROPE.

CHARACTERS:—The genus Lycoperdon embraces puff-balls, without a distinct stem, with flaccid peridia opening by definite mouths, spores not pedicellate and mixed with capillitia.

The peridium is flaccid and disperses the spores by collapsing directly opposite to the nature of the peridia of the Bovista series. It opens by a definite mouth; those species which have peridia brittle breaking away from the gleba are removed to the genus Calvatia.

The devolopment of the sterile base varies much in the same species and is of little specific value. The cells of the sterile base are usually large and evident. In one section (polymorphum) they are minute. The capillitium is usually long, branched colored threads; in one section (pratense) hyaline or light colored, and sometimes septate.

The cortex or exoperidium, sometimes smooth, but usually bears spines varying from minute to large. These spines are usually in fours, separate at the base the apices connivent. The nature of the cortex is one of the best of specific characters. We present on our plates enlargements (about 4 diameters) of the cortices of most of the species. These figures were made from dried specimens and the cortices are shriveled and not as distinct as they would be had the figures been made from fresh plants.

The color of the gleba when very young is white, as the plants ripen, it turns yellowish or olive, finally brown, or in one series (atropurpureum) when fully ripe it is dark purple. The spores can be divided into two series. 1st, the large rough spores 5–8 mic. in diameter; 2nd, the medium or small spores 4–5 mic. in diameter, and smooth or slightly rough. All plants with a purple gleba have large rough spores. The spores are borne on the basidia on long sterigmata. These are caducous and as the spores ripen, fall away. In the series with the large, rough spores the fallen pedicels remain mixed with the spores but in the small spored series they largely disappear from the ripe gleba.†

HISTORY:—Linnaeus called all "puff-balls" and some that are not "puff-balls" Lycoperdons.‡ He did not know enough mycology to avail himself of Michelius' earlier and much better work with the families of these plants. Persoon adopted largely the ideas of Michelius, and he was honest enough to say so, but he changed most of the family names of Michelius because "the names are little harmonious they have been suppressed."†

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†We consider pedicellate spores the best and plainest character in the puff-ball family and we would class all species of the Lycoperdaceae with pedicellate spores in the genus Bovistella. But one European species, which has not been so referred, Bovistella pedicellata, is affected by this view.

‡A tip for the name changers. Linnaeus first called the plants Conoplea "full of dust."

In tracing back the species of the genus Lycoperdon in the museums and literature of Europe, little that is definite can be unearthed previous to Vittadini. It is certain that the old botanists Vaillant, Michelius, Schaeffer, Bulliard gave some very bad cuts of these plants. Many of them cannot be even identified at this day. The early botanists who gave names, Linnaeus, Batsch and Fries in his Systema, worked mostly with these old figures, and as a result their work is as vague as the old figures. Persoon got his ideas of the genus Lycoperdon directly from plants but it was before the days of the microscope and his characters are largely drawn from their size form and color, which characters are of little value in specific distinction. Besides the vast amount of pioneer work that Persoon did prevented him from getting definite ideas of the species of Lycoperdon. This is evident from his herbarium where he has labeled many of his plants with a ? mark. I was much disappointed in not being able to decide definitely as to the most of Persoon's species.

Vittadini was the first author to do clear and concise work with the genus. He plainly points out the characters of his species, and gives good illustrations of them. His specimens, correctly labeled, are found in the museums of Kew and Paris to-day. Almost every one of Vittadini's species can be definitely known.

Much confusion has been introduced into the history of European Lycoperdons through the work of Bonorden who wrote shortly after Vittadini. Through the kindness of Dr. Magnus I had inquiries made but was unable to find that he left any specimens. He was a close observer, too close in fact, for he observed and recorded many unimportant details such as the color of the plant at different stages of its growth, which details are of no value and tend only to confuse. He described thirteen "new species" which has proven an unlucky number for most of them are unrecognizable. Fuckel issued exsiccatae of many of Bonorden's species and as both lived in the same region, Fuckel's specimens are often taken as a kind of commentary on Bonorden's species. Fuckel misnamed such common species as Lycoperdon gemmatum, which no one should mistake, and I feel that not much dependence can be placed on his interpretation of Bonorden's puzzling species. We have adopted a couple of Bonorden's names but we adopt them on Dr. Hollós' interpretations. In this connection, we will state that we believe the Doctor reached his conclusions thereon mostly from the appropriate names Bonorden gave plants; thus "fuscum" for the dark species; "cupricum" for the copper colored species, etc. At any rate, they are good names for the plants and we think the Doctor was wise in adopting them.

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†This was before the days of modern advertising methods of affixing men's names to the names of plants. If a plant was misnamed or bore an uncouth or inharmonious name the old botanists simply changed it and gave a better name to the plant. It is a pity that the same principle cannot be followed to-day but under the present advertising system it would lead to too much fraud. If such a method were in vogue however, what chance would the Hungarians have with their "Disciseda Debreceniensis" or the Russians with their "Secotium michailowskjanum."

A recent work by Dr. Hollós "Gastromycetes Hungariae 1903" has much to commend it. The fine plates are the best that have ever been published. It is the only work excepting Vittadini's issued in Europe from which I think a student can reach correct conclusions concerning the views of the author. I consider that there are two very serious faults in the Doctor's work which I shall not now enlarge upon except in a foot note.† With the exception of Vittadini's and Hollós' works, little deserving of extended notice has been done in Europe. The greatest master of European agarics, Fries, published but one work on the gastromycetes. In his earlier days "Systema" appeared which although largely drawn from books and figures has had more influence in establishing nomenclature than any other one work.

SECTIONS OF THE GENUS.—We would divide the Lycoperdons of Europe into the following sections.

"ATROPURPUREUM" SECTION.—Gleba dark purple when fully ripe. Plants that are collected young however the gleba remains olive or umber.

Spores large 5–8 mic., rough, mixed with fallen pedicels. Capillitium colored.

"GEMMATUM" SECTION.—Gleba brown when mature. Columella prominent. Capillitium light colored, whitish to the eye when freed from the spores. Spores small or medium, 4–5 mic., smooth or slightly rough.

"PRATENSE" SECTION.—Gleba brown, distinct from sterile base. Capillitium light colored or hyaline, sometimes septate. Spores small or medium, smooth.

"POLYMORPHUM" SECTION.—Plants of a decided yellow cast. Cortex small, nodular or furfuraceous. Capillitium deeply colored. Sterile base none, or well developed with minute cells. Spores small or medium, smooth (in some species slightly rough).

"SPADICEUM" SECTION.—Characters as previous section excepting the cells of the sterile base are large.

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†1st. The Doctor's nomenclature apparently has but one object in view—the addition of the word "Hollős" to new combinations. It is all done under the plea of "priority" and one might suppose from the space devoted to its discussion that the Doctor was an earnest advocate of this system. Such happily is not the case, as the Doctor's work testifies. In scores of instances the Doctor used better judgment and adopts the names in use merely citing in his synonyms prior references and gives no reasons for not adopting them in his nomenclature.

2nd. Had the Doctor devoted himself to the subject matter of his book "The puff-balls of Hungary" he would have issued a very excellent work for the Doctor has a good knowledge of that subject. But unfortunately, he has not done this. He skims around in the Library at Berlin and picks out a multitude. (I counted 31 in 7 pages of his synonyms) of plants that grew in Africa, Asia, North and South America and of which he never saw a specimen, and proceeds to reduce them to synonymy. I refer only to specimens still preserved, that could have been seen, and should have been seen, before any author takes such wholesale liberties with them. He arranges them in rows covering 46 pages, an evidence of a vast amount of labor and work (clerical). A large part of this is only guess work and some of the conclusions that the Doctor reached by this method are far from the facts. A few may be cited as instances.

"That Bovista abyssinica is a synonym for Bovista plumbea." Bovista abyssinica is a Lycoperdon and does not belong to the genus Bovista.

"The entire description of Diplocystis Wrightii is explained on an unripe still closed Geaster mirabilils." This was a good guess when the Doctor first published it, for he knew nothing about it, and under the circumstances one guess is as good as another. After the publication however, of a photographic plate showing that Diplocystis Wrightii has no resemblance whatever to Geaster mirabilis such statements should have no place in a scientific work."

"All species of Diploderma are based on unopened geasters." Some of them are nearer related to phalloids in their spores than they are to geasters.

We could multiply these examples many times but enough we think have been given to show that a large part of this section of the Doctor's work is purely speculation. This is very unfortunate for great expense and much labor have been put on the publication and we would be pleased could we give the entire work our unqualified approval.

THE "ATROPURPUREUM" SECTION.

LYCOPERDON ECHINATUM (Plate 41).—Plants obovate or pear shape, with slender, white, fibrous roots. Cortex of long *black* spines 3–4 mm. long, thickened at the base, with connivent at the apex falling off and leaving the peridium *reticulate* with circles of minute spinules that surround the large spines. Sterile base of large cells. Gleba dark, finally purplish. Spores large, 6–7 mic. rough, mixed with fallen pedicels.

This species is at once and readily recognized by its long, coarse spines such as are found with no other European species. The American form has more slender spines. It does not seem as though it could be confused and yet Fries referred Persoon's plant to a variety of Lycoperdon gemmatum (sic.) and redescribed it as Lycoperdon constellatum.

Specimens in our Collection.

England, Anna L. Smith, Wm. L. W. Eyre.

France, E. Boudier, X. Gillot, Prof. Lagarde

Hungary, L. Hollós. *Switzerland,* Denis Cruchet.

LYCOPERDON HOYLEI.*—This plant agrees with echinatum in everything excepting that the sterile base is compact and composed of very minute cells. It bears the same relation to echinatum that polymorphum does to spadiceum. We have seen only the type specimen at Kew which was collected in England.

LYCOPERDON ATROPURPUREUM (Plate 42).—Plants varying much in shape and size from little pear shaped specimens an inch in diameter to large turbinate plants with a thick stem.† Sterile base formed of large cells. Cortex on upper portion of fine, stellate, connivent spines about 2 mm. long, usually reduced below to scattered, furfuraceous spines. The degree of coarseness or fineness of the spines varies in different collections. In old specimens the spines fall off leaving the surface smooth. Gleba varying much according to age, at first olive, then dark umber‡ finally (if the plant ripens naturally) dark purple. Capillitium colored, branched. Spores large, 5–7 mic. rough, mixed with fallen pedicels.

This is a frequent plant in Europe but varies so much in the cortex nature that it has received a number of names. In tracing it back we do not feel as though we can go beyond Vittadini§ and certainly we can not find a more appropriate name than he applied to it.

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†Prof. Patouillard finds about Paris specimens so closely resembling Bulliard's plate of Lycoperdon hiemale as to raise the question whether Lycoperdon atropurpureum was not the original of the much discussed and variously interpreted plate.

‡If the plant is collected before it is fully ripe the gleba never changes beyond the umber state, hence in collections colors of various specimens are found umber and purple that do not seem at first to be the same plant.

§Characteristic specimens from Vittadini are found in several of the museums of Europe.

If we go back to Persoon we find he called the plant by three names,[†] none of them as appropriate as Vittadini's.

SYNONYMS.—Lycoperdon decipiens (Flo. Alg.) Lycoperdon asterospermum.[‡]

Specimens in our Collection.

Sweden, L. Romell, C. G. Lloyd. *Germany,* Johanna Schultze-Wege.
France, A. Acloque, J. Lagarde. *Italy,* O. Mattirolo.
Austria, A. Weidmann, G. Bresadola. *Hungary,* L. Hollós.
Portugal. Rev. C. Torrend.

LYCOPERDON UMBRINUM* (Plate 43).—No plant is more variable than atropurpureum in the nature of cortex, specimens varying in all degrees from those with granular, furfuraceous cortex to those with distinct, cruciate spines. The former form we call Lycoperdon umbrinum, following Persoon. Persoon applied the name however, to the form with dark spinules. The usual form has the spines light colored, (Lycoperdon molle, Persoon, Lycoperdon glabellum Pk).

Specimens in our Collection.

Sweden, Erik Haglund, C. G. Lloyd.
Germany, Johanna Schultze-Wege, Otto Jaap.
France, N. Patouillard, Monsieur Maingaud, L. Rolland.
Italy, M. Bezzi, O. Mattirolo. *Austria,* Rev. G. Bresadola, Jos. Rompel.
Hungary, L. Hollós. *Spain,* T. de Aranzadi. *Portugal,* Rev. C. Torrend.

LYCOPERDON DELICATUM* (Plate 44, fig. 1).—This is a form globose depressed, differing only in shape. The cortex is of the umbrinum type in the only specimen we have.

Specimen in our Collection.

Portugal, Rev. C. Torrend.

LYCOPERDON ELONGATUM* (Plate 44, fig. 2, 3 and 4). —This is a cylindrical form that usually grows in moss. The cortex is of the umbrinum type.

Specimens in our Collection.

Germany, Johanna Schultze-Wege. *Portugal,* Rev. C. Torrend.

LYCOPERDON VELATUM (Plate 44, fig. 5, 6, 7 and 8).— Plants obovate or piriform. Sterile base of large cells. Cortex *double;* the inner of minute fascicled spines, densely covering the peridium; the outer of a loose soft membrane or veil completely covering the plant in its early stages and as the plant develops, breaking up into ragged pieces which partly adhere loosely to the inner cortex or finally fall away. Gleba brown, then purplish. Capillitium colored. Spores large, 6–8 mic. rough.

[†] He gave a good illustration of the form with dark, reduced spines under the name Lycoperdon umbrinum and emphasized the dark color and minute nature of the spines. 2nd, he called the plant with minute, light colored spines Lycoperdon molle and although all subsequent workers, Massee, Morgan and Hollós have been enabled to determine "Lycoperdon molle Persoon," none of their plants have any relation to Persoon's. A specimen of Persoon's molle is found in Hooker's herbarium. It has large, rough, purple spores. A modern writer describes the spores as small, smooth and olive and subsequent writers have fitted to this description various plants not failing to add "Persoon" as authority for their work. Persoon himself did not seem to have much definite idea about Lycoperdon molle. In his herbarium I found three specimens so labeled, two being this species, and one Lycoperdon gemmatum. In addition there are four or five plants that he has labeled with a ? and none of them I think are this species. 3rd, Lycoperdon hirtum is the name Persoon applied to the form with well developed spines.

[‡] Montagne describes this plant as differing from atropurpureum in having no cells to sterile base. The type is a mere fragment and it is impossible to use it with exactness as a type.

This is a rare plant in Europe and but one collection has reached us. The peculiar cortex is well represented in some of the earliest figures.[†] Vittadini's figure shows the outer cortex too thick but the specimen he left (see Plate 44, fig. 8) is very characteristic.

Specimen in our Collection.

France, N. Patouillard.

LYCOPERDON CUPRICUM (Plate 45).—Plant with white, fibrous roots. Sterile base of large cells. Cortex of fine, appressed, stellate, connivent spines which fall away and leave the peridium smooth and polished. Columella prominent. Gleba dark umber.[‡] Spores medium, 4–5 mic. rough.

The prominent character of the plant is the bright copper color. After the spines fall the smooth polished surface appears like a sheet of copper. There is one discrepancy with the original description. The spines while small *are* "discernible without a glass." The appropriate name that Bonorden gave it leaves to my mind no doubt of its reference. However, the color is poorly shown in Hollós' figure which is unfortunate as *the color* is *the character* of the plant. A few specimens of Lycoperdon atropurpureum we have with color of peridium tending toward this species, which we refer to atropurpureum on account of the purple gleba and larger, rougher, spores.

Specimens in our Collection.

Denmark, J. Lind. *Germany,* Johanna Schultze-Wege.

Austria, A. Weidmann. *Spain,* T. de Aranzadi.

LYCOPERDON FUSCUM (Plate 45).—Plants varying from pear shape with scanty, sterile base to stalked with well developed base.[§] Cortex very *minute stellate black* spines, densely covering all portions of peridium and very uniform in size. In old specimens they partially fall off leaving the peridium at first reticulate finally smooth. Peridium of a *dark* brown color. Gleba umber brown, very rarely it takes a purplish tint. Spores medium 4–5 mic. rough.

I accept this plant in the interpretation of Dr. Hollós as I know nothing of Bonorden's plant. It is rare in Europe but I have collected it abundantly one season growing in woods over leaves at Eglon, W. Va., in the United States. The dark color of the plant is noticeable, and the minute, tufted black cortex spine characteristic.

Specimens in our Collection.

Belgium, Madame Rousseau. *France,* J. Lagarde. *Portugal,* Rev. C. Torrend.

[†] Viz. Vaillant t. 16, f. 4, and Michelius t. 97, f. 3, also though exaggerated I think in Michelius t. 97, f. 2. A very early name based on this figure is Lycoperdon mammaeforme Persoon, and I am surprised that Dr. Hollós did not dig it up and adopt it or Batsch's earlier name Lycoperdon lanatum based on the same figure.

[‡] I think it becomes purplish though I have never so seen it.

[§] The only three collections we have from Europe are small, oval specimens but in the United States no species varies more in shape.

THE "GEMMATUM" SECTION.

LYCOPERDON GEMMATUM (Plate 46).—Plants usually turbinate, with a globose head, and a cylindrical well developed base. It takes a number of forms, sometimes more globose with a thicker stem, sometimes more elongated, almost cylindrical; sometimes it is distinctly lacunose. Cortex of *soldered* warts like little "gems" that fall away and leave scars on the peridium.† These warts vary in shape. Some have a thickened base tapering rather abruptly to slender apex; most are thick and pyramidal. All are surrounded at the base by a circle of minute spinules which remain after the wart has fallen forming the "scar." In old weathered specimens these spinules finally fall away leaving the old peridium smooth. Lycoperdon gemmatum can always be easily recognized by these peculiar soldered warts or the scars where they have fallen. Sterile base usually well developed of large cells. Columella prominent. Capillitium colored,‡ branched threads. Gleba olivaceous, then brown. Spores small 4 mic. minutely rough.§

This is one of the two very common species of Lycoperdon in all temperate countries. It grows usually on ground in woods, rarely on logs. Sometimes it is caespitose, generally more scattered. The various forms are hardly worth separate mention. Yellow forms are not rare. I have often collected a little rigid form in clayey soil. When particularly robust the plant is usually lacunose.

SYNONYMS.—There seems to be a tradition among writers that there is a Lycoperdon perlatum that should be separated from Lycoperdon gemmatum. I never could grasp the difference between them. Persoon's specimens of perlatum are the ordinary form of gemmatum *tout-a-fait.* There is also a tradition that there is a plant differing from gemmatum that should be called Lycoperdon excipuliforme. I do not know the plant but Scopoli based this name on Vaillant's figure, surely of Lycoperdon gemmatum. If there is such a plant it should be given another name.

Specimens in our Collection.

Sweden, L. Romell, Erik Haglund, C. G. Lloyd.
Denmark, J. Lind. *England,* Annie L. Smith, Wm. L. W. Eyre.
Belgium, Madame Rousseau, C. Vam Bambeke.
Germany, Johanna Schultze-Wege, W. Krueger, Otto Jaap.
Switzerland, Denis Cruchet.

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†I hold that all specimens with "soldered" warts that I have seen belong to this species. I do not know whether the warts of this species are really "soldered" from originally separate spines or whether the usual spines of other species are split by the growth of the peridium from one original "soldered" wart. It is a question that can only be settled by a series of observations and cross sections of the warts of the cuticle of very young specimens. Observations of the mature plants would tend to the latter conclusion and Prof. Massee who has done some work in this line tells me it is his conclusion. However, that that may be, Lycoperdon gemmatum is the only species to my mind where large warts remain "soldered" on the mature plant.

‡When the spores are shaken out the capillitium both of gemmatum and piriforme has a whitish appearance to the eye.

§In water under a quarter objective they appear smooth. Boiled in lactic acid to swell the epispore minute spines can be seen. One author describes the spores of Lycoperdon gemmatum as smooth in one of his books and as rough in another. Smoothness or roughness of Lycoperdon spores is largely a question of magnification. To my mind a spore to be called rough should be plainly seen to be rough mounted in a drop of water and under a quarter objective.

France, N. Patouillard, Monsieur Maingaud, L. Rolland, J. Lagarde, A. Acloque.

Italy, O. Mattirolo. *Austria,* Jos. Rompel, A. Weidmann.

Hungary, L. Hollós. *Portugal,* Rev. C. Torrend.

Yellow forms—*Sweden,* L. Romell. *France,* M. Barbier, N. Patouillard.

Austria, J. Brunnthaler, Jos. Rompel.

LYCOPERDON NIGRESCENS (Plate 47).—Plant with sterile base of large cells. Cortex of stiff black spines, 2 mm. long, in clusters of four and surrounded at base by minute warts. The large spines fall off leaving the surface reticulate with the minute warts. Gleba olive-umber without purple. Spores medium, 4–5 mic. slightly rough. Pedicels caducous.

This name is based on a specimen in Persoon's herbarium. Persoon published it as a form of gemmatum which it can well be considered. Bulliard's plate 340 has warts of this nature but the general plant has more the aspect of gemmatum. Lycoperdon nigrescens differs from gemmatum in the separate black warts not coalescing into one, but I suspect all degrees of more or less coalescent warts occur, connecting the two forms.

Specimens in our Collection.

Sweden, L. Romell, Erik Haglund, C. G. Lloyd.

Austria, A. Weidmann, Jos. Rompel. *Scotland,* Mary L. Miles.

LYCOPERDON PIRIFORME (Plate 48).—Plants usually pear shaped, growing generally densely gregarious on old stumps, logs, etc. Long, white, fibrous, mycelial strands penetrate the rotten wood and are always a noticeable character of this plant.

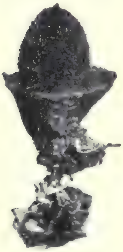

Fig. 83

Cortex of minute, fasciculate spines, subpersistent, and evenly spread over the peridium. Sometimes they have a tendency to coalesce into nodules. Sterile base usually well developed, sometimes almost absent, of small cells. Columella prominent (fig. 83†). Gleba olivaceous, then brown. Capillitium colored, long, branched. Spores small 4 mic. globose, smooth.

This is one of the two very common species in all temperate countries. It generally grows on logs and stumps but occasionally is found on the ground, from mycelium that I think remains where wood has rotted. As it grows on logs it is generally caespitose and compressed. On the ground I have seen it more scattered and regular in form.

Specimens in our Collection.

Sweden, L. Romell. *Belgium,* Chas. Van Bambeke. *England,* Wm. L.W. Eyre.
Scotland, Mary L. Miles. *Germany,* Otto Jaap. *Switzerland,* B. Studer.
France, L. Rolland. *Austria,* J. Brunnthaler, A. Weidmann, P. Magnus.
Hungary, L. Hollós.

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† By carefully removing the peridium, the central gleba attached to the columella is shown in an oval form as in figure 83.

LYCOPERDON DESMAZIERES* (Plate 49).—An elongated, cylindrical form of Lycoperdon piriforme is rather frequent in Europe but much rarer in America. It has every character of the usual form excepting the strong development of the sterile base and its elongated shape.

The plant is represented in several museums in Europe through Desmazieres' exsiccatae where it is called Lycoperdon piriforme var. excipuliforme. We do not use such a cumbersome name, and excipuliforme cannot be used as a binomial on account of uncertainty now attached to this name in the literature of Europe.

Specimens in our Collection.

Sweden, C. G. Lloyd. *England,* Annie L. Smith.
Belgium, Madame Rousseau. *Germany,* Johanna Schultze-Wege.
Switzerland, Denis Cruchet. *France,* L. Rolland.

LYCOPERDON SEROTINUM* (Plate 50).—A form of piriforme occurs in which the cortex is broken up into areas. We call this serotinum, following Hollós, but know nothing as to Bonorden's plant. We are not sure but this is also tessellatum but we shall reserve this name to apply to a form with *indurated areas* (Plate 50) which we know only from America.

Specimens in our Collection.

Sweden, L. Romell.

THE "PRATENSE" SECTION.

LYCOPERDON PRATENSE (Plate 34).—Plant depressed, globose, bowl-shaped. The peculiar shape which this plant takes (see plate 34), is characteristic. Cortex of short spines (about 2 mm. long), which fall away from the old specimens leaving the peridium smooth. Peridium opening by a large, irregular mouth.‡ Sterile base broad, of large cells separated from the fertile portion by a distinct diaphragm.§ Gleba olive then brown. Capillitium hyaline (or faintly colored), branched, sparingly septate threads. Spores globose, smooth, light colored, very uniform in size, 4 mic.

This is a common species in Europe but I could not trace it back definitely in European history beyond Vittadini. It is certainly his Lycoperdon hiemale but unfortunately, he took the name from Bulliard's plate, which, almost as certainly is not this plant. There is a tradition|| in Europe that it is Persoon's Lycoperdon pratense and we

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‡In its dehiscence the species is intermediate between Calvatia and Lycoperdon.

§A peculiar character by which the species is easily known. Only distinctly marked in one other European species, L. cruciatum.

||All the indications that I could find point toward the truth of this tradition. It is so labeled in Desvaux's herbarium and he was contemporary and a co-worker with Persoon. Persoon's figure represents the shape and size well though the smooth surface is broken into little areas, a character the plant never takes in my observation. Persoon left no certain specimens but there are four specimens in his herbarium all labeled with a doubtful mark. I did not recognize them. Persoon states that the plant "comes in dry places and herbs and even in the woods among grass," (around Paris). This plant is common there to-day. Dr. Hollós refers Persoon's species to Lycoperdon cruciatum (or rather Lycoperdon cruciatum to it) but that species has never been collected about Paris.

adopt the name as it is necessary to have some name, and we would not wish to use a recent name for such a common plant. While common in Europe it does not to my knowledge occur in the United States.†

Specimens in our Collection.

Sweden, L. Romell. *Denmark,* J. Lind. *England,* Annie L. Smith.
Belgium, Chas. Van Bambeke.
Germany, P. Magnus, Otto Jaap, Johanna Schultze-Wege.
France, N. Patouillard, L. Rolland, M. Barbier, A. Acloque.
Austria, Rev. G. Bresadola, A. Weidmann, Jos. Rompel.
Hungary, L. Hollós. *Holland,* Rev. C. Torrend.

LYCOPERDON CRUCIATUM (Plate 51).—Peridium globose or usually depressed, often plicate beneath, and with a strong root. The sterile base of large cells usually occupies one quarter to a third of the interior. Sometimes in small specimens almost none. Cortex of strong cruciate spines about 2 mm. long, which adhere together and peel off in patches from the peridium. This peculiar method of cortex separation is characteristic of the species. The surface of the peridium after the separation of the cortex is dull, minutely furfuraceous, and dark brown in color. Gleba olive, when ripe dark brown, never purple. Capillitium colored, sparingly branched. Spores globose, small, 4 mic. smooth. Pedicels slender, caducous.

This plant is very rare in Europe, very common in the United States. In comparing the two plants we note that the diaphragm separating the fertile from the sterile portion is more strongly marked in the European plant. Otherwise we note no difference. Rostkovius gave a characteristic illustration and we have always used his name. If Dr. Hollós in digging back for an old name had contented himself with stopping at something definite, Vittadini's name, marginatum, we should have adopted that name for the purpose of uniformity, for although Vittadini's illustration is abnormal as to shape, we are convinced from his specimens it is the same plant. But when the Doctor digs up Lycoperdon pratense of Persoon and Lycoperdon papillatum of Schaeffer, both of them contrary to the traditions and scanty evidence that exist in Europe, we cannot follow him. In digging for an old name, if one wants to antedate the definite work of Vittadini and Rostkovius, everything points to Lycoperdon candidum of Persoon.

Specimens in our Collection.

Italy, O. Mattirolo. *Austria,* A. Weidmann, Rev. G. Bresadola.
France, "Herault Dorat" Spec. from Museum, Paris.

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†We have now an accummulation of several hundred collections of Lycoperdon from the United States which will be our next task to carefully work over and study. We do not remember having seen this plant among them.

THE "POLYMORPHUM" SECTION.

LYCOPERDON POLYMORPHUM (Plates 34 and 52).—Plants belong to the yellowish series, varying much in the development of the sterile bases. There exists a continuous series from plants with well developed stem-like sterile bases (L. polymorphum typical); to subglobose plants with scanty sterile bases (L. cepaeforme); to little, globose specimens devoid of sterile bases (L. pusillum). The nature of the sterile bases differs from that of most other Lycoperdons. It is compact, very similar in general appearance to the fertile portion, and composed of minute cells not visible to the naked eye. Cortex of minute nodular, granular or furfuraceous spines. Gleba at first bright yellow, then brown but never purple. Capillitium deeply colored, branching threads. Spores globose, small 3–4 mic. smooth.

This plant was first well described by Vittadini and we have adopted his name. His specimens are still in existence and he was the first to point out the peculiar sterile base character by which the plant is distinguished from most other known Lycoperdons. In addition his name is peculiarly appropriate for there is no more polymorphic species known. There is a tradition in Europe that the plant is Lycoperdon furfuraceum of Schaeffer. This is probable, but at the same time Schaeffer's old crude cut fits Lycoperdon spadiceum as well as it does this plant and as long as we keep these two species distinct we cannot go back consistently to this old cut for our name. The typical form with well developed base is not rare in Europe,[†] but I have seen no more finely developed specimens than I received from Rev. C. Torrend, Portugal, which we have used in the photographs for our plate.

Specimens in our Collection.

Sweden, L. Romell. *Austria,* J. Brunnthaler.
Hungary, L. Hollós. *Portugal,* Rev. C. Torrend.

LYCOPERDON CEPAEFORME[*] (Plate 53, fig. 1, 2, 3, and 4).—This is only a subglobose form of polymorphum with a slight development of the peculiar, compact, sterile base. Judging from the specimens I have received, it is relatively rare in Europe but it is the common form in the United States.

Specimens in our Collection.

Belgium, Madame Rousseau. *Germany,* Otto Jaap, W. Krueger.
France, N. Patouillard, P. Hariot, X. Gillot, L. Rolland.

LYCOPERDON HUNGARICUM[*] (Plate 53, fig. 5, 6, 7, and 8).—Plants globose with none or very little compact, sterile base. Color yellowish then brown. Cortex minute nodular or granular spines. Capillitium colored. Spores medium, 4–5 mic. slightly rough.

We are somewhat in doubt as to our reference of this plant. Our specimens are so close to Lycoperdon cepaeforme that the only difference we can note is the slightly rough spores. We are not among those

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[†] I do not recall having seen it from America though I may find it when I work over my American specimens.

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who do not give to spores the same privilege of slight variation as to any other character. We think spore characters are of as much relative value as any other character, and no more.

Specimens in our Collection.

Belgium, Chas. Van Bambeke. *Italy,* M. Bezzi. *Portugal,* Rev. C. Torrend.

LYCOPERDON PUSILLUM* (Plate 53, fig. 9, 10 and 11).—The distinction between Lycoperdon cepaeforme with very little development of the sterile base and Lycoperdon pusillum with no sterile base is so slight that specimens of the same collection even, may embarrass the systematist. Still, the little form that occurs typically in Europe of L. pusillum is unique. Rarely over a centimeter in diameter it is perfectly globose, with a strong tap root and a furfuraceous cortex. The gleba does not tend to olive so strongly as in other forms of polymorphum but is a clear brown. We are unable to distinguish any marked difference in the spores as recently shown in a picture.

Specimens in our Collection.

Germany, Otto Jaap. *Austria,* A. Weidmann, Rev. G. Bresadola.
France, N. Patouillard. *Italy,* M. Bezzi. *Hungary,* L. Hollós.

THE "SPADICEUM" SECTION.

LYCOPERDON SPADICEUM (Plate 54).—Plants usually obovate with short stem-like sterile base of large cells. Color when young yellowish, becoming light brown when fully ripe. Cortex of minute nodular, granular or somewhat furfuraceous spines. Frequently we note on the peridium little white granules that seem to be of the nature of a lime deposit. Gleba at first olive, finally brown. Capillitium colored. Spores small, 4 mic. smooth.

We accept this name on the interpretation given by Dr. Hollós. Persoon left no specimen, and all that can be said is that the plant does not disagree with his scanty and rather vague description. The plant agrees with Lycoperdon polymorphum in everything excepting that it has large cells in the sterile base. In Australia there are intermediate forms connecting the two species.

SYNONYM—Lycoperdon Cookei (J. R. Mic. Soc. 87-714).

Specimens in our Collection.

Russia, A. de Jaczewski. *Denmark,* J. Lind. *Belgium,* Madame Rousseau.
France, J. Lagarde, L. Rolland, N. Patouillard, A. Acloque.
Austria, A. Weidmann. *Hungary,* L. Hollós.

ADDITIONAL SPECIES.

Lycoperdon acuminatum, a little species that grows in moss on bark of tress, and Lycoperdon oblongisporum, also a little species with oval or oblong spores have been reported from Hungary. We have seen no specimens from Europe.

A number of plants have reached us that depart in some respects from the species as we know them, and which we are unable to refer satisfactorily to any known species. We might describe these as "new species" and give them a name but we feel that they are more probably aberrant forms, and that to "describe" and "name" them would only add to the difficulties and not to the elucidation of the subject. One robin does not make a summer, and one collection does not make a species.

From L. Romell, Sweden, we have a plant with large, rough spores of atropurpureum type but with a *white cortex* of thickened spines, cruciate, and on the order of gemmatum but not "soldered."

From Wm. Krueger, Germany, a plant apparently pratense but *bright yellow,*

From Annie L. Smith, England, a plant apparently a form of nigrescens, as to cortex and spores,, but shape of Desmazieres and notably *yellow* in color.

From Wm. Krueger, a plant we would call umbrinum if it were *not yellow.*

From C. Crossland, England, a plant similar to spadiceum in general appearance but spores rough. Perhaps a form of umbrinum but spores very small for that species.

Should enough of any of these forms reach us to justify the opinion that they are in any degree constant, we shall "describe" and "name" them, but for the present we think they had better be passed by.

CAULOGLOSSUM TRANSVERSARIUM.

(Plates 12 and 40.)

When we issued our plate 12 of Cauloglossum transversarium we did not have a very abundant supply of specimens and the figures were taken mostly from a collection we had seen in Ellis' herbarium. On our return from Europe last year, we found awaiting us a fine collection, both dried and in alcohol, that had been sent by Mr. A. S. Bertolet, from Fairhope, Alabama. These specimens give us quite a different idea of the shape the plant assumes from what we previously conceived and we consequently issue another plate (40) to illustrate this fine collection.

We think the plant is not as rare in the Southern States as is generally supposed. Mr. Bertolet certainly collected it abundantly. We found it well represented in the museums in Europe all from the collections of Curtis and Ravenel. Berkeley at first intended to call the genus "Arthymenium" but that is another story.

QUELETIA MIRABILIS.

Dr. Wm. Herbst, Trexlertown, Pa., kindly favors me with a correction of a statement in a previous issue regarding Queletia mirabilis. He says:—"The part stating the time is incorrect as occurring only once. I collected specimens for three years in succession, 1891, 1892 and 1893, most abundantly in 1892, none having appeared after 1893. The tan bark on which they grew became very much decayed and no fresh additions were made after the tannery was abandoned."

We thank Dr. Herbst for kindly correcting us in this matter, as the impression we had from him was that he had only collected it one season.

REV. G. BRESADOLA.

Foremost in the ranks of the mycologists of Europe to-day stands the man whose photograph we present above. We have been in close correspondence with him for years, and we believe he has a critical knowledge of mycology such as is possessed by few. On him we depended when we wrote our pamphlet on the geasters for advice in the treatment of names of synonyms. In every instance where we followed his advice, his views have since been confirmed by the independent investigations we have made in Europe. We received his photograph as a matter of friendly regard and its appearance in Mycological Notes will be as much of a surprise to the donor as it is a pleasure to us to be able to present it to our friends.

MITREMYCES RAVENELII UPSIDE DOWN.

Those who have to do with printers always meet with trouble. There have been so many errors in Mycological Notes that we aimed to be particularly careful with the last issue and we think very few if any typographical errors got through. But we encountered a new trouble. In the last proof we saw of p. 201, the cut Mitremyces Ravenelii was correctly inserted. The pressman in underlaying the cut transposed it and in the article it appeared upside down. This matter is very annoying but we presume as long as one is dependent on printers he will always have his troubles.

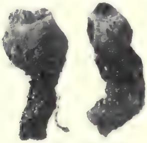

Fig. 84

PRINCIPLES OF PRIORITY.

"We owe much to Mr. Lloyd who has never failed to wield his pen trenchantly when vagaries and inconsistencies are practiced in the zeal to establish a stable nomenclature. We do not believe that the principle of "priority" can be dethroned, but we do commend the view taken above, namely that it is absurd to attempt to overthrow a name because *"based on young specimens."—Journal of Mycology, September, 1904.*

We have no desire to *dethrone* the "principle of priority" nor have we any intention of *enthroning* it as a little idol and then bowing down to worship it to the exclusion of better principles, viz. use, justice, and common sense. We firmly belive in "Priority" as long as it is based on anything definite and does not disturb names that are firmly established by years of general and definite use. For example, no one of the present generation has had any doubts about the meaning of the words Tremella, Polysaccum, Puccinia, Mitremyces, Cyathus. They were established by authoritative use before the present generation of mycologists was born.

It is just as futile for anyone now to try to change these names for sentimental, theoretical or personal reasons as to change the word "America" because that was not the original name applied to it by early explorers; or to change the name "Cincinnati" because that city was first called "Losantiville." Use makes all languages; it is the "natural law" of languages, and it cannot be overthrown by theorists who in a few instances may be honest but in the majority of cases are only working for personal conspicuity.

Nor do we believe in learning the genera of some man who has done original and creditable work, and from whom we get all our information as to the genera, and then go to digging about for some old, vague reference that we can interpret only in the light of his work, and proceed to blot out his established names. Such methods violate the first principles of common honesty and justice. If we adopt another man's ideas we should be honest enough not to juggle his names.

The modern "priorist" in botany is, to use an expressive term, "between the devil and the deep blue sea." If he follows his ignis fatuus into the vague regions of antiquity, his nomenclature becomes a jargon that nobody understands or cares to bother with, and such good work as he does, if he does any will surely by this same rule be lost in the abyss he opens up. If he attempts to use priority as a foot ball to kick his own name forward, and ignores it where it does not serve this purpose he becomes a mere trickster and nobody is so obtuse as not to see through the scheme.

STATIONS FOR ANTHURUS BOREALIS.

In our last issue we made a request for additional stations of Anthurus borealis. Several have kindly favored us with information.

W. W. Stockberger sends us a specimen collected in the edge of a drain, August 20th, 1901, at Granville, Ohio.

Geo. B. Fessenden writes us, "In your note on Anthurus borealis you take note of the 'stocky form' of the photograph of the English plant collected by Mr. Carleton Rea. I would say that the specimens I found several years ago at the Brighton Stock Yards were many of them fully as 'stocky' as Mr. Rea's. I found a few fully an inch in diameter and six or seven inches in length. I thought at the time they were an introduced species here, but they have been found in several localities since, all of the small variety. I found them several years ago at Holbrook growing in a tomato field.

C. C. Hanmer writes me that he has found it, at East Hartford, Conn., "all small specimens in a newly stocked lawn. It appeared in July and August, 1903."

Mr. Hanmer also writes that "E. A. White of Storrs, Conn., collected it there during the summer of 1904 in a potato field."

Geo. E. Morris, Waltham, Mass., writes, "Dr. Oscar E. Fischer, now president of the Detroit Myc. Club, found a single specimen near a heap of stable refuse in Allston, Mass., in the fall of 1898 or about that date." "In November, 1900, the fungus came up in a tomato patch in Waltham, of course, long after the crop was gathered. It was abundant and was probably introduced in fertilizers."

It will be noticed that the stations given above are mostly Eastern and that the plant only occurs in locations tending to the conclusion that it is an introduced plant.

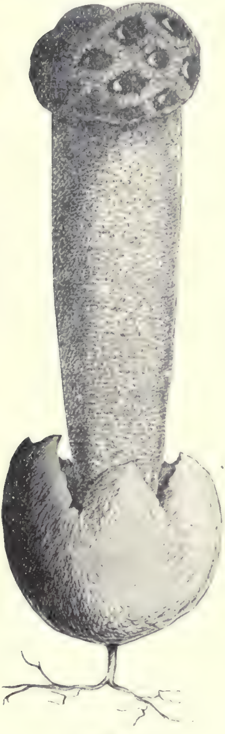

Fig. 85

WANTED STATIONS AND PHOTOGRAPH OF SIMBLUM RUBESCENS.

This plant was originally collected on Long Island and I think like Anthurus borealis is of relatively rare occurrence. Rev. J. M. Bates finds it in Nebraska and has sent us a dried specimen. There is a record somewhere of its collection in Kansas by E. E. Bartholomew. W. H. Scudder gathered it at Washington, D. C. (cfr. Myc. Notes, p. 146). Charles McIlvaine writes us that he found a single specimen in Talbot Co., Maryland. It would be a special favor if some one will have a good photograph of the plant made for us. We would like to use it in the plates that we hope some day to present of the American phalloids. The original cut which we reproduce herewith (fig.85) appears to be a good representation of the plant but we are partial to photographic reproductions.

If you know any facts as to its occurrence and localities, kindly favor us with the details.

MYCOLOGICAL NOTES.

BY C G. LLOYD.

No. 20.

CINCINNATI, O. JUNE, 1905.

THE LYCOPERDONS OF THE UNITED STATES.

CHARACTERS:—Having given the general characters of the genus Lycoperdon on page 205 in connection with the species of Europe, we will only add a few lines in reference to spores and gleba colors. In a general way the spores of Lycoperdon can be divided into two classes. 1st, The *large, rough* spores 6-8 mic. and 2nd, the small or medium (4-5 mic.) smooth or slightly rough spores. No one should ever confuse members of the 1st series for the nature of the spores is evident even under a low power. The 2nd series, however, is often very difficult to determine even with the best objective. A number of species have smooth spores in specimens usually collected, which become "slightly rough" in fully matured specimens.

The color of the gleba is the source of more trouble even than the spores, and to divide the genus into "purple" and "olive" spored series leads to many errors. Some species (echinatum, etc.), have gleba that quickly turns purple and they all have large, rough spores so that they are readily recognized. With other species of the atropurpureum type, the gleba changes very slowly and only reaches the purple stage if the plant ripens in situ. If the plant is collected before it is fully ripe the color change is arrested, so that plants of this type are liable to be referred to the "olive" series. In addition, plants of the gemmatum type, ordinarily dark umber when fully ripe, will occasionally develop a slight, purple tinge in old or weathered specimens.

HISTORY:—There have been three important papers on the American Lycoperdons.

First, by Prof. Peck in the 32nd Report (1879). This is a very plain description of the species that he had seen and studied as they grew, and in my opinion is the best account that has appeared. Practically the same paper, to which was added a compilation of species described which he had not met, was published (Trans. Albany Inst. Vol. 9, 1879), under the title "United States Species of Lycoperdon."

Second, Prof. Trelease published a paper on "The morels and puffballs of Madison (Wisc.)" in Trans. Wisc. Acad. of Science, 1889. It was a good paper and brought out a number of new facts and in the main the determinations are correct. Unfortunately, it was illustrated with most miserable figures.

Third, Prof. Morgan wrote an account of the United States Lycoperdons in Jour. Cin. Soc. Nat. History (1891). Prof. Morgan made

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a close study of the microscopic features and discovered a number of new points in the structure, as the hyaline, septate threads of Lycoperdon Wrightii. He also gave the best illustrations that have been given. He depended too much for his determinations on an inaccurate monograph that had then recently appeared in Europe, and his nomenclature is not as correct as the previous papers.

None of these writers have had an intimate knowledge of the European species, but drew their conclusions from books and descriptions, but fewer errors resulted than would have been expected from these conditions. Prof. Peck and Morgan have kindly placed their plants conveniently for my study, and Morgan has most of the plants of Trelease so that I am conversant with the specimens on which their papers were based. Under each species, I give the names of the plants as they have been published in these three American papers, but I will not in this article introduce the confusing synonymy of Europe.

SECTIONS OF THE GENUS:—We would divide the Lycoperdons of the United States into the following sections.

"ATROPURPUREUM" SECTION.—Spores large, rough, 5-8 mic. Gleba dark purple when fully ripe. Capillitium colored.

"GEMMATUM" SECTION.—Gleba brown when mature. Columella prominent. Capillitium light colored, whitish to the eye when free from late spores. Spores small or medium 4-5 mic., smooth or slightly rough.

"PRATENSE" SECTION.—Gleba brown, distinct from the sterile base. Capillitium hyaline (or light colored), often septate. Spores small or medium, 4-5 mic. smooth.

"POLYMORPHUM" SECTION.—Plants of a decided yellow cast. Gleba olive then brown. Capillitium deeply colored. Sterile base compact, of minute cells. Spores small or medium 4-5 mic. smooth, or in some species slightly rough.

"SPADICEUM" SECTION.—Characters as in the previous section excepting the sterile base is composed of large cells.

Plants occur which on *all* their characters cannot be referred to any section. The best we can do is to locate them in the section to which they seem the closest.

The "Atropurpureum" Section.

The first four species, echinatum, pulcherrimum, rimulosum and subvelatum are always readily placed in this section as the gleba *quickly turns* dark purple and specimens are rarely collected in which this cannot be noted at once.

The remaining species and their forms are most puzzling indeed, however, as the gleba turns very slowly and only becomes purple if the plants ripen *in situ*. If collected and dried before the gleba is ripe the color remains umber or even bright olive, hence specimens ordinarily would not be referred to the purple section. Species have been based on such collections and placed in the "olive series" by those who divide the genus along these lines.

LYCOPERDON ECHINATUM (Plates 41 and 55).—Plants obovate or pear shaped or (in the United States) generally globose, or globose depressed. Mycelium of fine, white threads. Cortex of long, *black* spines, 3-4 mm. long, falling off and leaving the peridium reticulate with circles of minute spinules that surround the large spines. In America the cortex of this species is not as coarse and stiff as in Europe. Sterile base of rather small cells, in this respect approximating the form "Hoylei" of Europe. Gleba dark purplish.† Spores large, 6-7 mic. rough, mixed with fallen pedicels.

This is a rare species in the United States but a marked one. It is known by its long, *black* spines.

References:—Lycoperdon constellatum in papers of Peck and Trelease. (Fries' constellatum is purely a synonym for Persoon's echinatum, and that Fries should misinterpret this characteristic plant is evidence of how little study he gave to "puff-balls.") Lycoperdon echinatum in Morgan's paper.

Specimens in our Collection.

Ohio, A. P. Morgan; *Kentucky,* C. G. Lloyd; *New York,* W. H. Long, Jr.; *Michigan,* L. E. Weld; *Wisconsin,* C. E. Brown; *North Carolina,* H. C. Beardslee.

LYCOPERDON PULCHERRIMUM (Plate 55).—Plants have a thick tap root. Pileus subglobose or obovate. Cortex of long, *white,* stellate spines 3-4 mm. long, the apices connivent. The spines fall away from the rich, brown peridium leaving the surface smooth. Sterile base of large cells. Gleba dark reddish umber when ripe. Spores large, 6-7 mic. rough, mixed with fallen pedicels.

This is well named for it is our "most beautiful" species. It can be recognized by its large, *light colored* spines. When young the spines are pure white, and if the plant is then collected and dried, they remain white. In old specimens they turn brownish but never so dark as the spines of the previous species. I have never had the good fortune to collect the plant but Prof. Morgan tells me that when fresh it is decidedly fragrant. No other puff-ball to my knowledge is fragrant. The plant does not grow in Europe. It is widely distributed in this country. It is nowhere very abundant apparently, and reaches its best development in the region of the Great Lakes.

References:—Lycoperdon pulcherrimum in Trelease and Morgan. Lycoperdon Frostii, Peck. Berkeley named and "described" the plant or rather he "misdescribed" it in such a manner that no one can blame Peck for "redescribing" it (cfr. Myc. Notes, p. 153).

Specimens in our Collection.

Maine, P. L. Ricker; *Wisconsin,* C. E. Brown (2 collections), R. H. Denniston (3 collections); *Minnesota,* Mary S. Whetstone; *Illinois,* Dr. L. H. Watson,‡ Joliet High School; *Indiana,* H. B. Dorner; *Pennsylvania,* Caroline A. Burgin (2 collections), Dr. Wm. Herbst; *Ohio,* A. P. Morgan (a fine lot); *Iowa,* T. J. Fitzpatrick; *Texas,* W. H. Long, Jr.

LYCOPERDON RIMULATUM (Plate 56).—Plants usually depressed globose with a strong tap root and a scanty, sterile base, filling one quarter to one third of the interior. Cortex smooth, in the typical form, closely adnate, and merely rimulose with age. Gleba quickly turning dark reddish purple. Capillitium colored, branched. Spores large 6-7 mic., rough.

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† None of my specimens have the gleba olive or umber so common in young plants of the atropurpureum and umbrinum type.

‡ One of Dr. Watson's collection has gleba a *bright olive,* due, I think, to condition under which collected and dried.

This plant often occurs in sandy locations. In the typical northern form the cortex is smooth and thin, (Plate 56 fig. 1) closely adherent to the peridium and merely cracking with age. As the plant extends South the cortex becomes rougher and thicker and the cracks more pronounced, (Plate 56 fig. 2) and finally in the extreme South, we find forms in which the cortex first breaks into areas, (Plate 56 fig. 10) then loosens up and finally falls away. The latter form we would call by a separate name.

SPECIMENS IN OUR COLLECTION.

Canada, John Dearness, A. S. Bertolet; *Maine,* P. L. Ricker; *Minnesota,* Mary S. Whetstone; *Michigan,* B. O. Longyear, A. L. Voigt; *Massachusetts,* Geo. E. Morris; *Pennsylvania,* Caroline A. Burgin, Dr. Wm. Herbst; *New Jersey,* J. B. Ellis; *Ohio,* A. P. Morgan, C. G. Lloyd; *Missouri,* N. M. Glatfelter; *Texas,* W. H. Long, Jr.; *Florida,* Mrs. M. A. Noble.

LYCOPERDON SUBVELATUM* (Plate 56).—This form mentioned above is very close to Lycoperdon velatum of Europe; in fact, I am not sure but the exact plant grows in Europe, as Vaillant's old figure (t. 16, f. 4), and Michelius' old figure (t. 97, f. 3) seem to be exactly our plant. However, the plants I have seen from Europe (Plate 44) have a more strongly developed base, a thicker cortex, and the peridium develops a distinct, secondary cortex under the veil.†

SPECIMENS IN OUR COLLECTION.

Florida, C. H. Baker, C. G. Lloyd.

LYCOPERDON ATROPURPUREUM (Plates 42 and 57.)—Plants as they occur in the United States are usually small, obovate or subglobose, from one half an inch to an inch and a half in diameter. Cortex *well developed,* slender, cruciate spines, disposed to disappear from the old specimens, leaving the peridium smooth. Sterile base well developed of large cells, often purplish in color. Gleba at first olive, slowly changing to umber and finally when fully ripe to dark purple. Spores globose, rough, mixed with fallen pedicels, varying in size from 5 mic. in the olive state to 6-7 mic. when fully ripe.

We take one idea of the typical form of this plant as it occurs in Europe and is illustrated by Vittadini, the form with distinct, *slender,* cruciate spines about 2 mic. long. It is frequent though not as common as the umbrinum form.

REFERENCES:—This is atropurpureum of al' previous American papers and is the form called in Peck's paper, "var. hirtellum." On this plant in the olive state is based "Lycoperdon echinatum" of Peck's paper (not Persoon) which was changed to Lycoperdon Peckii by Morgan. Also on the same olive state is based Lycoperdon perlatum of Morgan's paper (not Persoon).

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† Berkeley named our American plant Lycoperdon cyathiforme (sic.) for Ravenel who distributed it (No. 74) under this name.

Specimens in our Collection.

Canada, J. H. Cameron, A. S. Bertolet,† John M. Macoun†; *Maine,* D. A. Baldwin, H. C. Beardslee; *New Hampshire,* T. L. Smith; *Massachusetts,* R. B. Mackintosh, Mrs. Pierce, G. E. Morris, Simon Davis,‡ Mrs. Pierce,† H. Page,† *New York,* C. S. Conkling, Chas. Peck, C. S. Conkling,† Chas. Peck,† Chas. Peck,‡ (Type of L. Peckii); *Pennsylvania,* Dr. Wm. Herbst, Caroline A. Burgin, Mrs. Geo. M. Dallas, Dr. Wm. Herbst;‖ *Michigan,* A. L. Voigt, C. G. Lloyd;‡ *Wisconsin,* R. H. Denniston;‡ *Minnesota,* E. P. Ely, Minnesota Botanical Survey;⁑ *Illinois,* A. S. Bertolet, Dr. L. H. Watson, Dr. L. H. Watson;† *Ohio,* A. P. Morgan, C. G. Lloyd, August Selby,‖ C. G. Lloyd;‡ *Kentucky,* C. G. Lloyd; *South Carolina,* P. H. Rolfs;† *Missouri,* Dr. N. M. Glatfelter; *Nebraska,* G. G. Hedgcock; *Colorado,* Chas. E. Bessey.

It will be noticed from the above stations that the plant reaches us rarely from the South or West.

Forms of Lycoperdon Atropurpureum.

The plant is most puzzling, varying not only in size of spores and color of gleba according to conditions of ripeness, but very much as to shape and size. The usual form (unmarked in above list) is obovate or subglobose (Plate 00 fig. 00), one half to an inch and a half in diameter.

A more robust, large, subglobose form (as shown on our plate 00 fig. 00 of Lycoperdon delicatum†) we have indicated in above list with a †.

A pear shaped form, tapering to the base, with a somewhat slender stem we indicate with a ‡.

A large, turbinate form such as is shown on our plate 00 fig. 00 we indicate with a ‖.

A rare, subcylindrical form with a small head we indicate with a double star (⁑). This corresponds with the original Lycoperdon elongatum (type at Kew). We have received but one specimen, from Minn. Bot. Survey.

The following forms based on *cortex variations* we would distinguish by a separate name though it is often difficult to refer plants by this character.

LYCOPERDON STELLARE*(Plate 57).—This form has spines not so slender as the typical form but thick at the base. As shown in our figure (7 enlarged) the extreme form appears quite different from the usual, slender-spined form (fig. 00 enlarged). It is the form of atropurpureum with the most strongly developed spines, and we have never seen it typically from Europe.

References:—This form in Peck's paper is Lycoperdon atropurpureum var. stellare. It is Lycoperdon hirtum of Morgan's paper,† but this form does not seem to occur in Europe and Lycoperdon hirtum (of Persoon at least), I take to be the typical form of Vittadini's atropurpureum.

Specimens in our Collection.

Massachusetts, H. Page; *New York,* Chas. Peck; *Wisconsin,* R. H. Denniston, C. E. Brown; *Pennsylvania,* Dr. Wm. Herbst; *Ohio,* A. P. Morgan, C. G. Lloyd; *Kentucky,* C. G. Lloyd.

LYCOPERDON UMBRINUM (Plates 43 and 58).—This plant has all the interior characters described under Lycoperdon atropurpureum, including the slow change of the gleba and the various colors as found in collections. It is distinguished from atropurpureum (typical) by its reduced cortex spines. Many specimens occur however, that are difficult to refer to either species (see plate 58 fig. 3). Besides L. atropurpureum has a bad habit of losing its large spines when it gets old and retaining its small ones so that it is often impossible to decide to which form old specimens belong. In the small-spined form (umbrinum) there are two types of spines. The usual type is of a furfuraceous, granular nature (Plate 58 fig. 1). Another form has the small spines more regularly fasciculate and persistent (Plate 58 fig. 2). The latter is the type of spines we find in fuscum and cupricum and it is only possible to refer such specimens to these two species on the *general color* of the plant. Nor is it possible to split umbrinum along these lines for sometimes we find both types of spines on the same specimen. In shape and size the plant varies from little, pear shaped specimens not a half inch in diameter (Plate 58 fig. 4) to large, turbinate plants such as is shown on plate 58 fig. 7. Lycoperdon elegans* (Plate 58 fig. 10) is a large, robust, globose form. Lycoperdon delicatum* (Plate 44 fig. 8) is a smaller globose form. At first, though it does not seem possible, they are the same species but specimens of all intermediate forms and sizes are so common that it is not practicable to distinguish them at all. In the following list we have marked with a dagger (†) specimens tending to the large, turbinate form.

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† According to specimens he gave me, but spines "long and slender" do not apply well to it.

REFERENCES:—This plant appears as Lycoperdon glabellum in all the American papers also as Lycoperdon elegans in Morgan's paper. The same plant (cfr. Myc. Notes, p. 209) is common in Europe and we, of course, take the earlier European name for it.

SPECIMENS IN OUR COLLECTION.

Canada, John Dearness,† A. S. Bertolet, Miss I. M. Walker,† J. Macoun; *Maine*, H. C. Beardslee, D. A. Baldwin; *New Hampshire*, Miss Alice Theobald; *Massachusetts*, A. B. Seymour, G. E. Morris, H. Page, A. B. Seymour;† *New York*, Chas. Peck; Pennsylvania, Mrs. Geo. M. Dallas, Dr. Wm. Herbst, Hugo Bilgram, Caroline A. Burgin, C. H. Baker, Miss E. Hodges; *Washington, D. C.*, F. J. Braendle; *Wisconsin*, R. H. Denniston, Wisc. Myc. Club, R. H. Denniston,† C. E. Brown,† Wisc. Myc. Club;† *Minneapolis*, Mary S. Whetstone, E. P. Ely, E. P. Ely;† *Michigan*, L. E. Weld;† *Illinois*, Dr. L. H. Watson, Dr. L. H. Watson;† *Ohio*, A. P. Morgan,† C. G. Lloyd; *West Virginia*, C. G. Lloyd; *Tennessee*, Mrs. M. S. Percival; *North Carolina*, H. C. Beardslee;† *Iowa*, R. E. Buchanan, T. H. McBride; *Colorado (Pike's Peak)*, C. E. Bessey.

LYCOPERDON FLOCCOSUM* (Plate 59).—We note a form with same internal characters and the same coat of small, furfuraceous spines as Lycoperdon umbrinum, but which has a few large, soft, white, flocculent spines superficially over the inner coat. (Plate 59 fig. 1). It seems to me closest to umbrinum but it is analagous to velatum if the veil were reduced to a few, scattered, soft, flocculent spines.

REFERENCES:—This is Lycoperdon elongatum of Morgan's paper based on the elongated plant we figure (plate 59 fig. 3). Lycoperdon elongatum (type at Kew) is more cylindrical and does not have this cortex.

SPECIMENS IN OUR COLLECTION.

Maine, P. L. Ricker; *Massachusetts*, R. B. Mackintosh; *Pennsylvania*, Mrs. Geo. M. Dallas, Dr. Wm. Herbst; *Ohio*, A. P. Morgan, C. G. Lloyd; *Missouri*, Dr. N. M. Glatfelter; *Iowa*, R. E. Buchanan.

The following two species fuscum and cupricum belong to the atropurpureum section, but the average spores are smaller and it is rarely one notes the typical purple color of the gleba."† These two species are really *color forms* of the same species.

LYCOPERDON FUSCUM (Plate 45).—Plants vary much as to shape from little, globose specimens with scanty sterile base to *long stemmed* specimens, the stem often lacunose. Cortex of minute, fasciculate, *black* spines falling away and leaving the dark surface smooth. Gleba dark umber, rarely purplish. Spores 5-6 mic. rough.

The characters of the plant are its *dark* color and its habits. It grows in woods usually over fallen, decayed leaves. The character of the plant being color, and color being a bad character, it follows that light colored forms with same cortex are more apt to be referred to umbrinum.

SPECIMENS IN OUR COLLECTION.

Canada, Rev. P. Lemay, John Dearness; *Maine*, P. L. Ricker, H. C. Beardslee; *New Hampshire*, Hollis Webster; *Massachusetts*, F. L. Sargent, S. S. Davis; *Pennsylvania*, Mrs. Geo. M. Dallas; *Illinois*, Dr. L. H. Watson; *Washington, D. C.*, Fred J. Braendle, H. E. Warner; *West Virginia*, W. H. Walmesly, C. G. Lloyd; *Florida*, C. H. Baker.

LYCOPERDON DRYINUM* (Plate 59).—This is a little, subglobose form of Lycoperdon fuscum agreeing in habits, color and cortex but having very little or no sterile base. It bears the same relation to L. fuscum that L. pusillum does to L. polymorphum. The spores are smaller and smoother. It seems to be a rare form and we have but two collections of it.‡

SPECIMENS IN OUR COLLECTION.

Ohio, A. P. Morgan (Type), W. C. Dawson.

LYCOPERDON CUPRICUM (Plate 45).—This plant is only a color form of Lycoperdon fuscum. In its typical form it is a marked plant, the smooth peridium after the fall of the cortex is bright copper color, and resembles a sheet of copper. I have seen but two typical collections from this country,|| both western mountain forms.

SPECIMENS IN OUR COLLECTION.

Colorado (Pike's Peak), Chas. E. Bessey; *California (Quincy), E. P. Ely.*

LYCOPERDON EXIMIUM (Plate 59).—Prof. Morgan has kindly given me two specimens of this plant, collected by Underwood in Alabama. They are characterized by the oval spores (see silhouette

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† collected abundantly Lycoperdon fuscum one season at Eglon, W. Va., and only saw a very few specimens in which I could detect any purplish tinge to the gleba.

‡ It illustrates the dependence that can be placed on spore characters alone. It was described as having spores even and the gleba olivaceous, both being correct, and no one would think of placing it in the atropurpureum section. Yet to me it is certainly only a depauperate form of fuscum. Recently we have had a new Geaster described (G. leptospermus), and much stress placed on its smooth spores. I can see in it only a little reduced form of G. coronatus, and the plant to my mind being depauperate in other respects the same as L. dryinum, I see no reason why the *spores* should not be depauperate.

|| The specimens from New Jersey on which the previous record of this plant in this country has been based; while yellowish beneath, I think are closer to rimulatum, at least one of the specimens in its cortex.

plate 59 fig. 7). The large specimen (fig. 6) is fuscum as far as color and external characters go; the smaller one corresponds externally to type forms of atropurpureum.

The "Gemmatum" Section.

This section is known by the prominent columella; the spores small or medium, smooth or slightly rough; the light colored capillitium. It includes two of the most common species, gemmatum and piriforme, that occur abundantly in all temperate regions of the world.

LYCOPERDON GEMMATUM (Plate 46).—Plants usually turbinate or "excipuliform" with a globose head and a cylindrical well-developed base. It is very variable however, as to its shape. It can always be known by its cortex of "soldered" wart-like little "gems" that fall away and leave scars on the peridium, as it is the only species with these large "consolidated" warts. The "warts" vary much as to shape. Some have a thickened base tapering rather abruptly to slender points; most are thick, and pyramidal. Sometimes they densely beset the peridium, at other times are more scattered. All are surrounded at the base by a circle of minute spinules which remain after the large warts have fallen, forming "scars."

Sterile base usually well developed of large cells. Columella prominent. Capillitium light colored, branching threads. When the spores are shaken out, the capillitium has a whitish appearance to the eye. Gleba olivaceous, then brown.† Spores small, 4 mic. minutely rough.

This is one of the most common species we have.‡ It usually grows on the ground in woods rarely on logs. Sometimes it is caespitose, generally more scattered.

REFERENCES:—The plant is given as Lycoperdon gemmatum in all our American papers. Lycoperdon perlatum is a synonym for the species in Europe, but in Morgan's paper was applied to quite a different plant.

SPECIMENS IN OUR COLLECTION.

To list the various collectors who have sent us specimens would be practically to list each individual who had aided us by collecting specimens of "puffballs." We append a list of states and the number of collections received from each.

Canada, 16; *Michigan*, 6; *Wisconsin*, 9; *Minnesota*, 12; *Maine*, 2; *New Hampshire*, 6; *Massachusetts*, 23; *Connecticut*, 2; *New York*, 9; *Pennsylvania*, 22; *West Virginia*, 6; *Virginia*, 1; *Maryland*, 1; *New Jersey*, 5; *Washington, D. C.*, 5; *Illinois*, 5; *Ohio*, 10; *Tennessee*, 4; *Alabama*, 1; *North Carolina*, 2; *South Carolina*, 1; *Iowa*, 7; *Missouri*, 4; *North Dakota*, 2; *Arizona*, 1; *Colorado*, 1; *Washington*, 3; *Oregon*, 1; *California*, 4; *Unknown*, 5; total, 176.

FORMS OF LYCOPERDON GEMMATUM.

No plant is more variable in size, shape, color, and shape, density or paucity of spines. A "species maker" can go through our specimens and easily make numerous "species" out of them. When large and robust the plant is usually lacunose. I have collected a little rigid form in clayey soil. Yellow forms are not rare and we have some specimens from A. J. Hill, Canada, *bright yellow*. We list below a form that seems to be worthy of separate name.

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† Very rarely indeed we have noted old weathered specimens with a slight purplish cast.

‡ It is worthy of note that the plant appears to be rare in the South, and although we have some excellent collectors in Florida, none of them have sent in this species.

LYCOPERDON EXCORIATUM* (Plate 60).—This is a form in which the cortex warts adhere together and flake off in pieces as in Lycoperdon cruciatum. After the excoriation, the peridium is smooth and not "scarred" as in the normal form.

SPECIMENS IN OUR COLLECTION.

Maine, F. K. Vreeland; *New Hampshire*, Miss Alice Theobald; *Pennsylvania*, Miss E. Hodges.

LYCOPERDON NIGRESCENS (Plates 47 and 60).—Plant with sterile base of large cells. Cortex of stiff, black spines 2 mm. long, in clusters of four, and surrounded at base by minute spinules. The large spines fall away leaving the surface reticulate with the minute spinules. Gleba olive-umber. Spores medium, 4-5 mic. slightly rough.

This species is really a form of gemmatum excepting that the stiff spines are not consolidated. It is a rare plant in this country, and the warts while of the same nature are not so black as on the European plant.

SPECIMENS IN OUR COLLECTION.

Massachusetts, H. Page; *Maine*, F. K. Vreeland; *West Virginia*, C. G. Lloyd; *New York*, Chas. Peck; *New Hampshire*, T. L. Smith. (In the last two collections the warts are not "black.")

LYCOPERDON PIRIFORME (Plate 48).—Plants usually pear shaped, growing generally densely gregarious on old stumps, logs, etc. Long, white, fibrous, mycelial strands penetrate the rotten wood and are always a noticeable character of this plant.

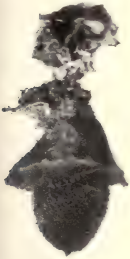

Fig. 86.

Cortex of minute, fasciculate spines, subpersistent, and evenly spread over the peridium. Sometimes they have a tendency to coalesce into nodules. Sterile base usually well developed, sometimes almost absent, of small cells. Columella prominent (fig. 83†). Gleba olivaceous, then brown. Capillitium colored, long, branched. Spores small 4 mic. globose, smooth.

This is one of the two very common species in all temperate countries. It generally grows on logs and stumps but occasionally is found on the ground, from mycelium that I think remains where wood has rotted. As it grows on logs it is generally caespitose and compressed. On the ground I have seen it more scattered and regular in form. It usually develops late in the season and in the fall our logs and stumps are frequently covered with it. It semi-persists during the winter and often very fairly preserved specimens are collected in the spring.

SPECIMENS IN OUR COLLECTION.

Canada, John Dearness, J. Macoun, Miss I. M. Walker, J. H. Cameron, A. J. Hill, T. R. Donnelly; *Maine*, F. K. Vreeland; *New Hampshire*, Miss Alice Theobald, C. E. Montgomery; *Massachusetts*, M. L. Fernald, G. E. Fernald, G. E. Morris, S. S. Crosby, T. L. Smith, R. B. Mackintosh, Geo. B. Fessenden, Walter Deane, Clara E. Cummings, Mrs. F. A. Pierce, Simon Davis, Wm. C. Bates, R. B. Mackintosh; *Maryland*, Chas. McIlvaine; *Indiana*, H. B. Dorner; *Illinois*, A. S.

Bertolet, Joliet High School, Dr. L. H. Watson; *Ohio*, David L. James, Wm. Knox, L. E. Cook, C. G. Lloyd, M. E. Hard, Willard Moore, Aug. Selby; *Kentucky*, H. Garman; *Tennessee*, H. M. Caldwell, Mrs. M. S. Percival; *North Carolina*, Fred K. Vreeland, Miss Mary Fitzgerald, H. P. Kelsey; *South Carolina*, P. H. Rolfs; *Florida*, C. H. Baker, C. E. Preston, A. L. Dean; *Michigan*, E. E. Bogue; *Wisconsin*, R. H. Denniston, Wisc. Myc. Club; *Minnesota*, E. P. Ely, Minn. Bot. Survey; *New York*, C. S. Conkling, Chas. Peck, S. L. Schumo, F. R. Rathbun; *Pennsylvania*, Hugo Bilgram, Dr. Wm. Herbst, Mrs. Geo. M. Dallas, Caroline A. Burgin; *West Virginia*, C. G. Lloyd; *Washington, D. C.*, Fred J. Braendle, P. L. Ricker; *New Jersey*, E. B. Sterling; *Iowa*, J. F. Clark, R. E. Buchanan, T. H. Macbride; *Missouri*, B. M. Duggar, Dr. N. M. Glatfelter, Geo. G. Hedgcock; *Washington*, W. N. Suksdorf, C. V. Piper; *California*, Edw. P. Ely.

Forms of Lycoperdon Piriforme.

The plant is quite variable as to shape. Usually it is somewhat pear shaped and compressed but when growing on ground it takes a more globose and regular shape. Yellow forms are occasionally found. We have these from S. L. Schumo, R. B. Mackintosh, and Wm. C. Bates.

The following forms we feel, are worthy of separate name.

LYCOPERDON DESMAZIERES* (Plate 49).—This form has the sterile base cylindrical and elongate, otherwise it is like the usual form. It is rare in this country, more common in Europe.

Specimens in our Collection.

Canada, A. J. Hill; *Washington*, C. V. Piper; *California*, Edw. P. Ely.

LYCOPERDON SEROTINUM* (Plates 50 and 61).—In this form the cortex is broken up into areas as well shown in our plate 61 fig. 1. Sometimes the areas are not as large as in the figure.

Specimens in our Collection.

Michigan, E. E. Bogue; *New York*, Chas. Peck, C. S. Conkling; *Massachusetts*, Elizabeth Harris.

LYCOPERDON TESSELLATUM* (Plate 50).—In this form the cortex is broken up into indurated areas. It has reached me several times from this country but never from Europe.

Specimens in our Collection.

Minnesota, Mary S. Whetstone; *Missouri*, Dr. N. M. Glatfelter; *Massachusetts*, R. B. Mackintosh; *Indiana*, H. B. Dorner; *Nebraska*, J. M. Bates.

LYCOPERDON FAVEOLUM* (Plate 61 fig. 4).—Is a curious form (or sport) in which the surface is covered with pits. It has reached me but once from B. O. Longyear, Michigan.

LYCOPERDON PSEUDO-RADICANS* (Plate 61).—We received these specimens from F. J. Braendle, Washington, D. C., growing in the white moss. They impressed me as being so peculiar in having the sterile base developed into a root-like projection that we have described them as a "new species" under the above name. (cfr. Myc. Notes, p. 84). We have since received no other specimens and with our further familiarity with Lycoperdon piriforme, we feel sure now it is only a form or perhaps a "sport" of that plant.†

The "Pratense" Section.

The main character of this section is the subhyaline (or in some species colored) capillitium, small, smooth spores, and in the typical species a strong diaphragm separating the fertile from the sterile portion. The type species Lycoperdon pratense, is a common plant in Europe and Australia but it does not occur, I think typically in the United States. Lycoperdon pratense, cruciatum and Wrightii typically belong to this section. The remaining species depart in general habits but are put here on account of the hyaline capillitium.

LYCOPERDON SUBPRATENSE (Plate 62).—Plants depressed globose, bowl shaped, the peculiar shape being characteristic. Cortex of short spines (about 2 mm. long) which fall away from old specimens leaving the peridium smooth. Peridium opening by a large, irregular mouth.‡ Sterile base broad, of large cells, separated from the fertile portion by a distinct line. Gleba olive then brown. Capillitium colored, branched threads. Spores globose, smooth, 4 mic.

This is a rare plant in the United States, reaching me from two stations in the extreme East and four stations in the extreme West. The Eastern plants (plate 62 figs. 1 and 3) are exactly the same as the type form in Europe excepting that they have *colored* capillitium. We have specimens of the Western plant from W. N. Suksdorf (Plate 62 fig. 2) apparently the same. We have other specimens however from the West (Plate 62 figs. 4, 5, 6, and 7) more robust and doubtful. There are four of these collections all *old* specimens which we place here for the present until we can obtain better material. Hyaline capillitium is an important character of the European plant but we cannot remove our American plant very far although it differs in an important character. In our opinion, it is the American expression of the European plant.

SPECIMENS IN OUR COLLECTION.

Massachusetts, A. B. Seymour, R. B. Mackintosh; *California*, Clara A. Hunt; *Oregon*, Jos. W. Marsh; *Washington*, C. V. Piper, W. N. Suksdorf.

LYCOPERDON CRUCIATUM (Plate 51).—Peridium globose, or usually depressed, often plicate beneath, and with a strong root. The sterile base of large cells is separated by a distinct line from the fertile portion. It usually occupies from one fourth to one third of the interior but sometimes in small specimens almost none. Cortex of strong, cruciate spines about 2 mm. long, which adhere together and peel off *in patches* from the peridium. This peculiar method of cortex separation is characteristic of the species. The surface of the peridium after the separation of the cortex is dull, minutely furfuraceous, and dark brown in color. Gleba olive, when ripe dark brown, never purple.

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† Dr. Hollos, who never saw a specimen in his life, publishes that the plant is a synonym for Lycoperdon muscorum. We presume he has reached this learned opinion because both plants grew in moss, which is just about as logical as to announce the synonymy of two agarics because both grow on logs. The Doctor should confine his guessing to the old pictures. He has made many messes in guessing about plants he never saw.

‡ The plant is intermediate between Calvatia and Lycoperdon in its dehiscence.

Capillitium hyaline or colored,[†] sparingly branched. Spores globose, 4 mic. smooth. Pedicels slender, caducous.

This plant is a very rare plant in Europe but a very common species in the United States. It grows in pastures and open places, also is often found in stubble fields after the grain is cut.

REFERENCES:—Berkeley correctly referred the American plant excepting he described some specimens that reached him with the cortex gone, as Lycoperdon calvescens. Peck first called it Lycoperdon separans, afterwards Lycoperdon Wrightii var. separans (cfr. Myc. Notes, p. 153) and Morgan used Peck's name Lycoperdon separans. The American plant cannot be distinguished from the European. It will be noticed from the list of stations given below that the plant extends over almost our entire country excepting the Pacific Coast states.

SPECIMENS IN OUR COLLECTION.

Canada, John Dearness, Miss I. M. Walker, T. N. Willing; *Maine,* D. A. Baldwin, P. L. Ricker; *New Hampshire,* T. L. Smith, C. E. Montgomery, Miss Alice Theobald; *Massachusetts,* Chas. W. Jenks, Simon Davis, R. B. Mackintosh, F. L. Sargent, Mrs. E. B. Blackford, T. L. Smith, C. E. Preston, A. L. Dean, S. S. Crosby, Clara E. Cummings, Geo. E. Morris, H. E. Warner, A. B. Seymour; *Connecticut,* J. B. Rorer, E. P. Ely; *Wisconsin,* R. H. Denniston, Wisc. Myc. Club; *Minnesota,* E. P. Ely, Minn. Bot. Survey; *Michigan,* B. O. Longyear, H. C. Beardslee; *New York,* Chas. Peck; *Pennsylvania,* C. H. Baker, Mrs. Geo. M. Dallas, Caroline A. Burgin, T. Gardner; *West Virginia,* W. H. Walmesley, C. G. Lloyd, Dr. J. G. Selby; *Washington, D. C.,* Margaret L. Sewall, F. J. Braendle; *New Jersey,* H. A. Bird, Mrs. Geo. M. Dallas; *Indiana,* H. B. Dorner; *Illinois,* W. S. Moffatt, A. S. Bertolet; *Ohio,* M. G. Bohn, Wm. Holden, Dr. H. L. True, W. C. Dawson, C. G. Lloyd, A. P. Morgan, E. J. Arrick; *Georgia,* Berry Benson; *Tennessee,* Mrs. M. S. Percival; *Alabama,* A. S. Bertolet; *Texas,* W. H. Long, Jr., J. W. Stiles; *North Carolina,* O. Katzenstein, W. L. Poteat, E. A. Lehman; *South Carolina,* P. H. Rolfs; *Florida,* Theo. L. Mead, G. W. Webster, Mrs. M. A. Noble, C. H. Baker, C. G. Lloyd, H. C. Culbertson, C. E. Pleas, H. H. Hume; *Missouri,* C. H. Demetrio, Dr. N. M. Glatfelter; *Kansas,* E. Bartholomew; *Iowa,* J. F. Clarke, L. R. Waldron; *Arkansas,* F. W. Patterson; *Nebraska,* Rev. J. M. Bates; *Colorado,* Chas. E. Bessey.

LYCOPERDON WRIGHTII (Plate 63).—Plants small, usually about a cm. in diameter, rarely 2 cm., generally caespitose. Cortex of small spines, about 2 mm. that flake off, but not in large pieces as the previous species. After the separation of the cortex, the peridium is furfuraceous. Sterile base of large cells but usually slightly developed, sometimes almost none. Gleba olive then brown. Capillitium of thick flaccid septate, hyaline threads two or three times the diameter of the spores. Spores small, 3-4 mic. smooth.

This little species is quite frequent in short grass, and takes kindly to yards, gardens and often to paths. It does not grow in Europe.[‡] Its peculiar capillitium character was first pointed out by Morgan.

REFERENCES:—The species was named and described by Berkeley from some old specimens that had lost their cortices and he gave a fairly good description of it excepting he mistook the furfuraceous remains on the old peridium for the cortex and described it as having "minute echinulate warts." Peck correctly refers it where he calls it "typicum" and Trelease has it right in his paper. Morgan misled by some bad work that had preceded him changed from Peck's and Trelease' determinations and called it Lycoperdon Curtisii.† This was doubly unfortunate for Morgan gave the best account and figure of it that have been given.

[†] I am very much puzzled to find capillitium, sometimes hyaline, sometimes colored. I think it varies under conditions. Perhaps this is the explanation of the species "Lycoperdon subpratense," though I never noted any colored capillitium in European specimens of that plant.

[‡] A recent European writer gives it as a synonym for Lycoperdon pratense, which statement has no semblance of truth.

SPECIMENS IN OUR COLLECTION.

Canada, J. Macoun, T. N. Willing; *Massachusetts*, Simon Davis, S. S. Crosby, R. B. Mackintosh, Geo. B. Fessenden, C. W. Jenks; *New York*, Chas. Peck, W. N. Clute; *Pennsylvania*, Caroline A. Burgin, Dr. Wm. Herbst; *New Jersey*, J. B. Ellis; *West Virginia*, C. G. Lloyd; *Washington, D. C.*, F. J. Braendle; *Wisconsin*, R. H. Denniston; *Minnesota*, Dr. N. M. Cook, E. P. Ely; *Michigan*, L. E. Weld; *Indiana*, Wm. Stuart; *Illinois*, Dr. W. S. Moffatt; *Ohio*, C. W. Dawson, Willard Moore, C. G. Lloyd, M. G. Bohn; *Kansas*, E. Bartholomew; *Missouri*, C. H. Demetrio, B. M. Duggar; *Iowa*, R. E. Buchanan, L. H. Pammel; *Texas*, W. H. Long, Jr.; *Colorado*, E. B. Sterling.

LYCOPERDON SUBINCARNATUM (Plate 63).—Plants with a rather firm, globose depressed peridium, opening by a rather large, (2-3 mm.) circular mouth. Cortex of small, fasciculate spines, falling away and leaving the peridium most characteristically marked with little depressions, like the surface of a thimble. Sterile base of large cells, but very scanty (or none). Gleba olive then brown. Capillitium of mostly simple, long, septate, thick, subhyaline threads about twice the diameter of the spores. Spores 4 mic. slightly rough.

This unique little species usually grows on logs,‡ and when young has the general appearance of Lycoperdon piriforme, and the same white, mycelial threads permeating the rotten wood. After the separation of the cortex, the denuded surface takes a light color, but I think is not well described as "flesh color" and I feel it is a pity the plant does not bear a name referring to the peculiar pitted surface which no other species has. It is rather a rare species, rarely met excepting in mountains or northern localities.

REFERENCES:—The plant is only a color form of Lycoperdon purpureum, but if it were identically the same plant we should use Peck's name in preference to Berkeley's for Peck gave a good description of it and Berkeley never had material from which he could derive a knowledge of the characters of the plant, even the peculiar, pitted surface. Lycoperdon purpureum was originally collected in the Bonin Islands (near Japan) and we found it last winter (in the mountains only) in Samoa. Ripe specimens cannot be distinguished from the American plant and young specimens only by the dark purplish black color.

SPECIMENS IN OUR COLLECTION.

Canada, Rev. P. Lemay; *New Hampshire*, Miss Alice Theobald; *Massachusetts*, H. Page; *New York*, Chas. Peck, S. L. Schumo, W. H. Long, Jr.; *Pennsylvania*, Hugo Bilgram (several fine collections); *West Virginia*, C. G. Lloyd; *Washington, D. C.*, F. J. Braendle; *Virginia*, S. L. Schumo; *Ohio*, A. P. Morgan.

LYCOPERDON ACUMINATUM (Plate 64).—Peridium ovoid (or globose)‖ very small, rarely over one half cm. Cortex at first almost a smooth, white coat, drying up and becoming furfuraceous. Sterile base none. Gleba olive. Capillitium of long, simple, subhyaline threads about twice the diameter of the spores. Spores small, 3 mic. smooth.

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† Lycoperdon Curtisii is based on some *young* specimens of a *large* species (probably cruciatum) just emerged from the ground, and should never have been determined, much less "named" and "described."

‡ Very rarely we have collected it on the ground in woods.

‖ Morgan states globose when young then ovoid, and he has observed it growing. We do not know. All the specimens we have (see plate 64) are decidedly acute. We have seen, however, little *globose* specimens from Java (Lycoperdon pisiforme, Montsumia, p. 158 (not Eng. Jahrb, 23, 556) Lycoperdon Henningsii, Sac. vol. 14), which we take to be a globose form.

This is a unique, little species, very rare we judge, growing in moss on bark mostly of living trees and of a Southern range only.

REFERENCES:—Although there are no type specimens in Fries' herbarium, there is no doubt it is the plant he described (Nov. Symb. p. 134), from Costa Rica (Orsted) and North Carolina (Curtis). He ascribed the name (incorrectly we think) on information from Curtis, to Bosc. We do not find any similar plant in Bosc' work. Morgan was the first recent author to correctly refer it to Fries' name. Berkeley, at one time evidently had a faint idea of it, for he sent a plant to Montagne labeled "Lycoperdon acuminatum B. & C." but he did not remember it, for he described the plant as a new species, Lycoperdon calyptriforme (Grev. 2-50) and Ravenel distributed it (Exc. No. 14), as "Lycoperdon leprosum Berk. & Rav."

SPECIMENS IN OUR COLLECTION.

Washington, D. C., F. J. Braendle; *Ohio*, A. P. Morgan. (We have also a collection, donor and locality unknown.)

LYCOPERDON FULIGINEUM (Plate 64).—Plants growing on rotten logs. Sterile base slightly developed (or none). Sometimes the plant is prolonged into a somewhat stem-like base, sometimes devoid of base. Cortex of minute, fasciculate, dark spines. Capillitium thick, hyaline, septate threads. Spores small, 4 mic. *strongly rough.*

This plant seems to be confined to warm countries. It has the general appearance, and the white, mycelial strands of Lycoperdon piriforme, but is readily distinguished by its capillitium and spores. It has a close relationship to Lycoperdon purpureum but the peridium does not become pitted.

REFERENCES:—It was described from Cuba (Jour. Linn Soc. 10-345) and again on the same page as Lycoperdon epixylon. Lycoperdon velutinum from Venezuela with a reddish brown color I take for the same plant; also Lycoperdon confluens (Bull. Myc. France, 99-203) although growing on manured earth.

SPECIMENS IN OUR COLLECTION.

Florida, H. H. Hume. (We have it also from Brazil, Rev. J. Rick.)

The "Polymorphum" Section.

This section is characterized by the *minute cells* of the sterile base, the small, often furfuraceous cortex, the yellowish cast of the plants and olive or umber (never purple) gleba, the deeply colored capillitium and small spores smooth (or in some species minutely rough). We do not have in the United States Lycoperdon polymorphum typical of Europe with its well-developed, sterile base of small cells (see plates 34 and 52). Most of our plants take the subglobose form (cepaeforme) with a scanty sterile base.

LYCOPERDON CEPAEFORME* (Plates 53 and 65).—Plants yellowish, small, globose or subglobose, varying in size from 1 to 3 cm. Cortex smooth† or of minute fasciculate or nodular spines. Sterile base scanty, compact, of small cells. Gleba olive then umber; when the plant first deliquesces the gleba is bright yellow. Capillitium of deeply colored threads. Spores small, 4 mic. globose, smooth.

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† Prof. Morgan bases his Lycoperdon cepaeforme (to distinguish it from L. coloratum and L. pusillum) on the thin, *smooth* cortex (see plate 65, fig. 1) of the young plants. We do not find such a cortex on any of our European specimens, hence it is not the character of "cepaeforme." If it characterizes a species it is a "new species." The "smooth" cortex, however, soon breaks up into little, fasciculate clusters (see plate 65, fig. 2, made from one of Morgan's specimens) hardly distinguishable from the ordinary cortex, and I feel that it is not practicable to use the character.

REFERENCES:—This is the only common form of polymorphum that occurs in the United States. It is included in all the American papers as Lycoperdon coloratum (a synonym for the European plant) and in Morgan's papers also as Lycoperdon cepaeforme.

SPECIMENS IN OUR COLLECTION.

Canada, J. Macoun, J. U. Lloyd, John Dearness, Rev. P. Lemay, T. N. Willing, Miss I. M. Walker; *Vermont*, Hollis Webster; *Massachusetts*, Simon Davis, Mrs. E. B. Blackford, H. Page; *New York*, Chas. Peck, W. H. Long, Jr.; *Pennsylvania*, Caroline A. Burgin; *Washington, D. C.*, F. J. Braendle; *Wisconsin*, C. B. Brown, Wisc. Myc. Club, R. H. Denniston; *Minnesota*, E. P. Ely, Minn. Bot. Survey; *Michigan*, B. O. Longyear; *Illinois*, W. S. Moffatt, L. H. Watson, A. S. Bertolet; *Ohio*, W. C. Dawson, A. P. Morgan, C. G. Lloyd, Dr. H. L. True, J. T. Lloyd; *Tennessee*, Mrs. M. S. Percival; *Florida*, C. H. Baker, H. H. Hume; *Texas*, W. H. Long, Jr.; *Missouri*, C. H. Demetrio, Dr. N. M. Glatfelter; *North Dakota*, L. R. Waldron; *Nebraska*, Rev. J. M. Bates; *Colorado*, Chas. E. Bessey; *Washington (State)*, W. N. Suksdorf; *California*, Mrs. Blanche Trask, Miss Alice Eastwood, T. W. Cowan.

LYCOPERDON PUSILLUM* (Plates 53 and 65).—Little globose specimens, rarely a cm. in diameter, which have all the characters of the preceding species, excepting they have no sterile bases, we call Lycoperdon pusillum. If we can note a sterile base, however slight, we put the plant with cepaeforme and if we cannot note a sterile base we call it pusillum. The distinction is too much like splitting hairs, and we suspect that different plants of the same collection may be referred to both species. In Europe, Lycoperdon pusillum seems more distinct with a ripe gleba color, clear brown. In American specimens the color is more of an olive tint and we think the typical European plant does not occur with us.

SPECIMENS IN OUR COLLECTION.

Canada, T. N. Willing, T. R. Donnelly, J. Macoun; *Massachusetts*, S. S. Crosby; *Connecticut*, E. P. Ely; *New Jersey*, J. B. Ellis; *Ohio*, C. G. Lloyd; *Iowa*, T. H. Macbride; *Louisiana*, Rev. A. B. Langlois; *Georgia*, Benj. Benson; *Florida*, G. W. Webster, C. H. Baker; *Washington*, W. N. Suksdorf; *California*, S. B. Parish; *Texas*, W. H. Long, Jr. All very dubious.

LYCOPERDON PSEUDOPUSILLUM.*—Specimens otherwise Lycoperdon pusillum have spores which under a high power and best objectives are slightly rough. These are called. Lycoperdon pseudopusillum, but it is another case of cutting the cloth too fine.

SPECIMENS IN OUR COLLECTION.

Wisconsin, C. E. Brown; *California*, C. R Orcutt; *Texas*, W. H. Long, Jr.; *Florida*, T. L. Mead (type).

LYCOPERDON OBLONGISPORUM (Plate 65).—Plants globose 1-2 cm. in diameter. Cortex of minute, fasciculate spines. Sterile base very scanty, of minute cells. Capillitium of branched, deeply colored threads. Spores elliptic, oblong 3-4 x 5-6 mic.

This little species corresponds to Lycoperdon cepaeforme in every particular excepting the peculiar spore shape.[†] It was originally described from Cuba and we have typical specimens from L. Damazio, Brazil. In this country it is a rare plant,[‡] only three collections having reached me.

SPECIMENS IN OUR COLLECTION.

Missouri (near St. Louis), Dr. N. M. Glatfelter;[§] *Ohio* (near Linwood), C. G. Lloyd. (Also some specimens, collector and locality unknown.)

The "Spadiceum" Section.

In Europe there seems to be but one plant (L. spadiceum) belonging to this section, which is the same as Lycoperdon polymorphum excepting the sterile base has large cells.[‖] In the United States we have four forms which are very puzzling and run into each other. Plants of this section are always of a yellowish cast, with minute spinules, sometimes furfuraceous in character. Color of gleba olive then dark brown.[¶] Spores medium 4-5 mic., ordinarily smooth, but when fully ripe minutely rough.

LYCOPERDON TURNERI (Plate 66).—Peridium globose, or obovate, yellowish when young. Cortex of small spines which fall away and leave the peridium smooth. Sterile base of large cells. Gleba olive then brown. Spores 4-5 mic. minutely rough.

We base our description of this plant on specimens from J. B. Ellis (given us by Prof. Morgan), and which were (as to the spores at least) the plants originally described. It is not a rare plant in the United States and we know no other name for it.[††] It is the original of Morgan's and in the main of Ellis' description.[‡‡]

SPECIMENS IN OUR COLLECTION.

Canada, Miss I. M. Walker; *Maine,* F. K. Vreeland; *Massachusetts,* F. L. Sargent, S. S. Davis, H. Page, R. B. Mackintosh, G. E. Morris; *Connecticut,* C. C. Hanmer; *New Jersey,* J. B. Ellis (type given me by A. P. Morgan); *Pennsylvania,* Mrs. Hannah Streeter, C. H. Baker, Caroline A. Burgin; *West Virginia,* C. G. Lloyd; *Illinois,* A. S. Bertolet; *Ohio,* Willard Moore, Dr. H. L. True, C. G. Lloyd; *Missouri,* C. E. Demetrio; *North Carolina,* Harlan P. Kelsey; *South Carolina,* P. H. Rolfs (type of Lycoperdon pseudumbrium); *Florida,* C. G. Lloyd.

LYCOPERDON COMPRESSUM* (Plate 66).—Plants subglobose, yellowish, growing caespitose and compressed. Cortex small spines, somewhat furfuraceous. Gleba olive then brown. Spores small, 5 mic., smooth or when fully ripe slightly rough.

[†] It is usually compared to pusillum, but I think the scanty sterile base, very evident in all my specimens, is generally overlooked.

[‡] Trelease is the only author to record it, and he states "rather abundant on bare ground in dense woods"

[§] Dr. Glatfelter collected his specimens "on a log." It usually grows on the ground.

[‖] The European plant has smooth spores as far as I have ever seen, the American plants slightly rough when fully ripe. I have a strong feeling, however, that they are only "geographical forms" of the same species.

[¶] But I think never truly purple.

[††] Excepting "Lycoperdon pseudumbrinum," a late name not very appropriate if we include the plant in the "spadiceum" section, and we have no evidence that it belongs in the "umbrinum" section.

[‡‡] Turner's plant, from Labrador, of which we have seen fragments at Kew and New York, is a much larger plant and has larger, rougher spores. We think it is probably umbrinum not fully ripe. Even if it is a different species, we do not feel it necessary to rename our plant which is the species *covered in the description*. Wise heads who make laws for others' use will probably not agree with this position.

This plant I have found at Eglon, West Virginia, growing on bare spots in pastures. It impresses me as being a large, robust, caespitose form of Turneri. In fact a number of collections have reached me that I do not know whether to call large Turneri, or small, separate growing, compressum.†

SPECIMENS IN OUR COLLECTION.

Maine, P. L. Ricker; *New Hampshire*, Miss Alice Theobald; *New York*, C. S. Conkling; *Minnesota*, E. P. Ely; *West Virginia*, C. G. Lloyd; *Ohio*, Dr. H. L. True, W. C. Dawson, C. G. Lloyd; *Missouri*, Dr. N. M. Glatfelter.

LYCOPERDON MUSCORUM (Plate 67).—A thick stemmed form of the previous plants grows singly in moss or short grass. It corresponds in shape to L. polymorphum of Europe.‡ In its young condition it has the same appearance as Calvatia elata but widely differs in its dehiscence. The gleba when ripe is very dark brown. The spores are slightly rough and not over 5 mic. in size.§

REFERENCES:—This plant was called "Lycoperdon molle, Persoon" in Peck's paper, and perhaps the determination was not so far wrong.‖ Morgan, who took his ideas of Persoon's species from Massee's erroneous spore description, changed the name of Peck's plant (without seeing it) to Lycoperdon muscorum. The name, I think, would have been far more appropriate to the next form, which always grows in moss whilst this form is found also in short grass, and similar places.

SPECIMENS IN OUR COLLECTION.

Massachusetts, Simon Davis; *New York*, Chas. Peck (Type), C. S. Conkling; *Michigan*, A. L. Voigt; *Minnesota*, Minn. Bot. Survey; *Mexico (old)*, J. N. Rose.

LYCOPERDON POLYTRICHUM* (Plate 67).—A very peculiar, slender form of the previous species grows only in hair cap moss. It is unique in shape and habitat, cannot be confused with any other and is always distinct, I think, from the previous form. The spores ordinarily are smooth but in old, fully ripe specimens they can be seen to be minutely rough under a good objective. It seems to be a rare plant and seldom reaches me, but I think more collectors would find it if they would hunt in patches of hair cap moss.

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† The difficulties of its classification are further enhanced by the fact that it has the same cortex as umbrinum, and also by the fact that typical, large-spored umbrinum specimens are often yellowish. None of the specimens we have show any tint of purple in the gleba, but, as we have previously stated, the purple gleba is only the final condition of umbrinum, and most of the specimens we have do not show it. Hence it may develop, in the future, that the gleba of compressum is really purplish, if the plants fully ripen in situ, and in that case it can be considered a small-spored form of umbrinum. I think probably it is "Lycoperdon molle" of Trelease's and Morgan's papers.

‡ Students may think it strange that I should hold that "shape" and "size" have no value whatever in umbrinum and atropurpureum, and yet form the "species" of the spadiceum section principally from these characters. The reason is that as the specimens are collected all kinds of shapes and sizes are found in the same collection of the former, while in the "spadiceum" section the main characters of each collection seem to be its habits and shape. I am aware it may not seem very consistent, but in working with these plants we have to recognize the characters we find, not what we would like to find.

§ The only character by which we decide as to some collections, whether to call L. muscorum or L. umbrinum.

‖ Compare note †, above, which equally as well applies to this plant; also note †, page 209, in reference to "Lycoperdon molle, Persoon."

REFERENCES:—When I first collected the plant at Eglon, West Virginia, I referred it to Peck's description of Lycoperdon molle under Morgan's name Lycoperdon muscorum, as Morgan had previously done, and sent specimens so named to Hollos who has since published it under this name. I also figured it in "The Genera of Gastromycetes" under this name, and when Prof. Peck saw my figure he kindly sent me specimens which he had referred to Lycoperdon molle, and stated he did not think it was the same plant I had illustrated and I fully agree.

SPECIMENS IN OUR COLLECTION.

Maine, H. C. Beardslee, F. K. Vreeland; *New Hampshire*, C. E. Montgomery; *New York*, Chas. Peck; *West Virginia*, J. Gilbert Selby, C. G. Lloyd.

THE GENUS MITREMYCES.

Young plants enclosed in a gelatinous exoperidium. Endoperidium dehiscing by slits between raised, rayed teeth. Gleba light sulphur yellow, consisting of globose or oblong spores mixed with hyphae remains, and enclosed in a spore-sac lining the endoperidium. Capillitium none.

This is a peculiar genus, none (excepting Mesophellia) being stranger in the entire puff-ball family. All the species have the mouths lined with red and in one of the American species the peridium is bright red.

DISTRIBUTION.—Four species occur in the United States. M. cinnabarinus, the most common species, extends east to Massachusetts and south along the Appalachian ranges to Florida and Texas and has been collected as far south as Jalapa, Mexico. M. lutescens seems to be a very local plant, most frequent at Washington, D. C. The only other stations I know, are in Maryland, North Carolina and Rugby, Tenn. M. Ravenelii is of more frequent occurrence but only in the Appalachian regions. M. Tylerii has only been collected near Washington, D. C. No species extends to the Mississippi basin or occurs in the Western States.

One of the American species, M. Ravenelii, has also been collected recently in Japan.

From Australia one species M. fuscus (and a small form M. luridus) are known.

The remaining species are restricted to the East Indian Islands and the southern peninsula of Asia. M. Junghuhni is best represented in collections from Java, Sumatra, Ceylon and the Himalaya Mts., India. M. insignis is known only from Ceylon, and M. orirubra from one collection, Straits Settlements. No species is known from Europe, Africa or South America.

THE EXOPERIDIUM.—The outer peridium of Mitremyces is of the nature of a more or less gelatinous volva, differing in this respect from all other Lycoperdaceae. It presents three types. In cinnabarinus, insignis and lutescens, it separates from the endoperidium leaving the latter relatively smooth.

In Ravenelii, Tylerii, orirubra and Junghuhni it breaks into areas and dries more or less as scales on the endoperidium.

In fuscus it falls off as a cap.

THE SPORES.—The species can be divided into two series as to the spores.

Junghuhni, lutescens, orirubra and insignis have globose, rough spores. Cinnabarinus, Ravenelii, fuscus and Tylerii have oblong, sculptured spores.

THE SPORE SAC.—The spores are contained in a special membrane lining the endoperidium. As the plant matures this spore-sac contracts forcing the spores through slits of the rayed mouths. All known species have this spore-sac though the genus Husseya was based on its supposed absence.

THE MOUTHS.—Among the Gastromycetes, as far as known, the mouths of Mitremyces are peculiar to this genus. They are raised rayed teeth and open by longitudinal slits between the teeth. In addition, whatever may be the color of the peridium, the mouths of all known species are red when fresh.

Section 1.—The Oblong-Spored Species.

MITREMYCES CINNABARINUS (Plate 8).—Rooting strands long, compact, dark when dry. Exoperidium gelatinous, at first "buckling" then breaking into pieces, which curl up and fall away. Endoperidium globose, smooth, bright red when fresh, the color fading in old specimens. Spores oblong, punctate, sculptured, varying much in size in specimens from different localities and even in the same specimens. From 6-8 x 10-14 to 6-8 x 12-20 mic.

This is our most common and widely distributed species. It occurs as far east as Massachusetts, as far south as Florida and Texas, and we have seen a specimen from Jalapa, Mexico. It does not extend west into the Mississippi basin.

SPECIMENS IN OUR COLLECTION.

Massachusetts, Geo. E. Morris, T. L. Smith, Hollis Webster, Clara E. Cummings, Simon Davis, Mrs. E. B. Blackford; *Pennsylvania,* Chas. McIlvaine; *West Virginia,* H. C. Beardslee, C. G. Lloyd; *North Carolina,* H. C. Beardslee, Ed. R. Memminger, A. G. Wetherby; *Alabama,* A. S. Bertolet.

MITREMYCES RAVENELII (Plate 9, and Plate 68).—Rooting strand long and slender. Exoperidium breaking up into small pieces, which dry up and remain attached, scale-like, to the inner peridium. Endoperidium dark brown when dry, scaly with the remains of the exoperidium. Raised, rayed mouth, bright red when fresh contrasting with the somber color of the peridium. Spores elliptical, oblong, slightly sculptured, varying much as to size 5-8 x 10-15 mic.

This plant is widely distributed in the Appalachian regions, and is the only species known to occur in Japan.† It has also been sent to Paris from China.

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†Specimens that we have received from our American correspondents are larger plants than the original type specimens that Ravenelii sent Berkeley. Those from Japan are almost the same size. All agree in other respects.

SPECIMENS IN OUR COLLECTION.

Pennsylvania, Dr. Wm. Herbst; *Washington, D. C.*, T. J. Braendle, C. L. Shear; *Tennessee*, H. M. Caldwell, Mrs. M. S. Percival; *North Carolina*, Miss Mary Fitzgerald, H. C. Beardslee, Hannah C. Anderson.

Japan, T. Yoshinaga; Dr. Hennings (from Museum Berlin).

MITREMYCES TYLERII* (Plate 68).—Rooting strands short, not exceeding the diameter of the peridium. Exoperidium mostly disappearing from inner peridium, a few scales usually remaining along its base. Inner peridium globose, small, 5-6 mm. in diameter, pale olivaceous color when dry, smooth above, somewhat scaly below. Mouth bright red. Spores oblong-globose 6 x 8 mic., faintly sculptured.

This little plant has only been received from F. J. Tyler, Washington, who collected first about twenty specimens in October, 1902, at Fort Ethan Allen, Virginia, and over fifty specimens in the same locality the next season. All the plants present the same characters and are as much alike as peas.

SYNONYM.—The plant was called Mitremyces Ravenelii var. minor† (Myc. Notes p. 127) and the name, while an error, might still be applied to it. It differs from Ravenelii in its smoother peridium, pale olive color, and smaller size (even than the small specimens of Ravenelii from which the original description was made).

MITREMYCES FUSCUS.—Rooting strands long, dark colored. Exoperidium (Plate 69 fig. 2) falling off in one piece as a cap. Endoperidium smooth, very dark color, almost black. Raised mouth red. Spores elliptic, minutely rough, 6 x 7-10 mic.

This plant is known only from Australia and Tasmania. Several collections are at Kew.

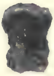

Fig. 87.

MITREMYCES LURIDUS* (fig. 87).—This plant has every character of the preceding excepting its small size. But one collection is known, made in Australia many years ago.

Section 2.—The Globose-Spored Species.

MITREMYCES LUTESCENS (Plate 9).—Rooting strands long, compact, yellowish. Exoperidium light yellowish, slightly gelatinous,‡ separating by splitting into irregular segments that remain (partially) at base of endoperidium like petals of a flower. Endoperidium pale, orange yellowish, smooth. Rayed mouth bright red when fresh. Spores globose, verrucose, 7-8 mic.

This species is readily recognized on sight from all others by the yellowish color of all its parts and the manner in which portions of the exoperidium remain separating at base of endoperidium. The globose spores also distinguish it from all other American species. It is a loca plant known from but four localities, but strangely enough is the mos common species at Washington, D. C.

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† The name "Mitremyces Ravenelii var. minor" is an error, no such variety having bee described. The name as found in Saccardo is founded on a typographical error in Greville (2-51) where the word "minor," intended as the first descriptive adjective, is printed as a pa of the name. But one collection of the species ever reached Berkeley, who states in a letter t Cooke that it consisted of only three specimens.

‡ Judging from dried specimens.

SPECIMENS IN OUR COLLECTION.

Washington, D. C., C. L. Shear, F. J. Braendle, Walter H. Evans, Margaret L. Sewall; *Rugby, Tennessee*, H. M. Caldwell, Mrs. M. S. Percival; *Hickory Gap, North Carolina*, Fred K. Vreeland; *College Park, Maryland*, F. H. Blodgett.

MITREMYCES INSIGNIS (Plate 69).—Rooting strands compact. Exoperidium a gelatinous volva apparently "sloughing off."[†] Endoperidium smooth, yellowish. Spores large, globose, coarsely spinulose, 15-17 mic.

This species is known only from two collections from Ceylon, now at Kew.

MITREMYCES ORIRUBRA (Plate 69).—Rooting strands short. Exoperidium breaking up into coarse, wart-like scales and remaining adnate to the endoperidium. Spores large, globose, tuberculate, 15-17 mic.

The species is known from a single collection from the Straits Settlement. It is readily distinguished from others by the coarse warts. The name "orirubra" is not distinctive as all known species have "red mouths."

MITREMYCES JUNGHUHNI (Plate 69).—Rooting strands short. Exoperidium breaking into small adnate scales. Endoperidium olivaceous. Spores large, globose, coarsely tuberculate. This seems to be the most frequent species of the East Indies and India. It is close to Ravenelii as to the exoperidium scales, differing widely in spore characters. Collections are known from Java, Sumatra, Celebes, and the Himalayas.

SYNONYMS.—Mitremyces Beyrichii is the mss. name under which specimens were distributed; Calostoma Junghuhni a "new combination;" Mitremyces Sarasini[‡] (Montsuma 1-24) Mitremyces viridis[§] (Jour. Bot. 51-201).

THE HABITS OF DIPLOCYSTIS WRIGHTII.

When Berkeley described Diplocystis Wrightii, he thought it grew on a log. The plant, which I have abundantly received through the kindness of L. J. K. Brace, Bahamas, and which is described in Mycological Notes, page 141, plate 15, does not grow on wood as Berkeley surmises. Mr. Brace writes me—"It grows on the surface of open areas, on the sides of a slight declivity which faces south where the soil is scanty and composed generally of detritus from the rock mixed with vegetable humus from fallen leaves. It also grows in open places at the foot of the declivity and on the top of the red soil."

[†] There are at Kew five or six specimens of this plant. All are free of the exoperidium excepting one. This has a membrane attached to the middle of the stem somewhat as shown in Berkeley's original cut made from this specimen. It impressed me as a gelatinous volva that had "sloughed off," and in this particular specimen had been dried adherent to the stem.

[‡] Based on a specimen from the Celebes, now preserved in alcohol at Berlin. Externally, the plant is M. Junghuhni in every respect. The difference in the tubercules of the spores as shown is due, I think, to the fact that those of Junghuhni were described from dried specimens, while Sarasini from spores preserved in liquid. If originally sent in formalin, it would have produced just such an alteration on the mucilaginous epispore.

[§] I think the "green" idea in connection with the plant is overdrawn, and based originally on a colored figure that was sent to Hooker from India. The dried specimen is not green, but rather olivaceous, the same exactly, as far as I could see, in color and other characters, as Mitremyces Junghuhni.

NOTE.—Calostoma Berkeleyi is based on a single small specimen from Ceylon that Berkeley had referred to Mitremyces lutescens (Linn. Jour. 14-78). It is Junghuhni, as far as external characters go. I did not succeed in getting spores, which are described as being smaller.

Mitremyces Pachystelis (Husseya pachystelis, Ces. Born. p. 13, Calostoma pachystelis n. c.) was "described" by an Italian from Borneo (the plant was from Borneo not the Italian) and figured as having an exoperidium an inch thick. I know nothing about it.

LOGIC OF A NAME JUGGLER.

"It is true that Lycoperdon echinus, Batsch (1783) is an older name for the fungus than L. umbrinum Pers. (1791), nevertheless I hold to the latter name as it is more appropriate, etc."—Quotation from Dr. Hollós, (Gas. Hung.).

"It is true that I learned from Morgan's work what the genus Catastoma is before I learned from Czerniaiev's what the genus Disciseda is."

"According to the principle of priority the name of the genus is the forgotten Disciseda."—**Quotation from Dr. Hollós, (Gas. Hung.).**

THE MAIN DIFFERENCE.

Lycoperdon echinus BATSCH.

Disciseda debreceniensis, (Harz) HOLLÓS.

Synonyms of "Disciseda debreceniensis (Harz,) Hollós," from Hollós' Gas. Hung.

"Globaria Debreceniensis, Hazl. 1877."
"Bovista subterranea, Peck, 1879."
"**Geaster Bovista, Klotzs, 1843.**"

The Doctor learned all he ever knew of the genus from Morgan's work, as every one else has done, but instead of adopting the name used by Morgan, he skirmishes around for an excuse to change it. Finally he finds an old, vague, generic name of Czerniaiev that no one had been able to interpret for fifty years, and never would have been able to decipher had it not been for Morgan's work, but which gave an excuse to make "new combinations" to which the word "Hollós" could be added. At the time he acknowledged that the genus "Disciseda" was so vague that not a single species could be identified. Still, it is priority and makes "new combinations" and that is all name jugglers are striving for.

But in the name of consistency, why is not the specific name "Bovista" prior? Is not "1843" prior to "1877?" I think the Doctor's conscience hurt him a little for he devotes more than a page of the book to explaining why the "Laws of Priority" require him to use the generic name "Disciseda." But not a word does he use to explain why the same "Laws" did not require him to use the specific name "Bovista," which (according to his own showing and to a specimen which he has seen and correctly referred) is thirty four years "prior" to the specific name he adopts. To propose to use the specific name "debreceniensis" on the ground of priority (aside from such a heathenish name) is a farce. Had the Doctor known the history of the plant, he would have known that it is not the first but the fifth specific name under which it has been described as a "new species."

We do not call the plant Catastoma subterranea because Peck called it "Bovista subterranea, n. s." We can see no particular merit in that, when it is neither a "Bovista" nor a "new species." We call it Catastoma subterranea on the ground of "priority," the priority of ideas, Morgan being the first man to do creditable work with the plant, and to formulate an intelligent idea of the genus. Every one has adopted Morgan's idea in regard to this genus; why not be honest and adopt his names also?

LEPIOTA BADHAMI.

"Your mycological observations are of much interest. One only appears to me to be in error. This is on the subject of Lepiota Badhami, which you have identified with Agaricus haematospermus, Bulliard. I am assured that the species of Bulliard has not the lamellae nor the white spores and is a little species, much smaller than Lepiota Badhami. The error seems to have been by reason of Prof. Quelet having confounded under the name haematospermus, Lepiota Badhami and Lepiota meleagris, and the species of Bulliard. The latter is identical with L. echinata Quelet, or Psalliota echinata and haematosperma, Fries, the latter author having the specimens under two names. The spores of Bulliard's Lepiota are at first an olive gray; if collected on glass and given free exposure they take a beautiful red color."

E. Boudier, Montmorency, France.

The above note is of great interest, but it is Bresadola (not we) see Myc. Notes, p. 54, who gives Agaricus haematospermus as a synonym for Lepiota Badhami. We have never seen Bulliard's plate.†

DUPLICATE NAMES.

The great cry, when one proposes to use binomials as *the names of plants* and omit the advertising feature of a personal name, is—"What will you do when two authors call different plants by the same name?" In nineteen cases in twenty where this occurs the second author has misdetermined the first author's plant and hence, putting the first author's name after it does not help matters at all. In a large proportion of the twentieth cases, different plants are given the same name by the same author. Thus Berkeley found a "new species" of Lycoperdon from India which he called Lycoperdon delicatum, and some years afterward he found another "new species," but quite a different plant from America, which he called Lycoperdon delicatum. How can you distinguish these plants by writing "Berkeley" after them? Such cases are bound to confuse, and in this instance we were confused when we made our note on page 153. Morgan knew of the duplication of this name but was careful not to draw attention to it.

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† NOTE.—This item has been standing in mss. for perhaps a couple of years and was crowded out of the Notes. We have since seen Bulliard's plate.

Had he done so it would have saved at least two resultant errors. Massee discovered the duplication and changed the name of the American plant to Lycoperdon Berkeleyi. And now Hollós has become confused and refers Lycoperdon Berkeleyi as a synonym for the Indian plant, a form of Lycoperdon umbrinum. It is a synonym for Calvatia craniiformis which has but little relation to the Indian plant. Hollós is further in error when he ascribes the name to Morgan. As Berkeley was so partial to the name that he gave it to two "new species," we feel he is entitled to all the advertisement due to any one in connection with its use.

ONLY FOR A SMILE.

A list of plants with authors' names attached has a very "scientific" look. Sometimes they are instructive as well as pleasing to the eye, for instance the following from recent lists:—

"Mycena Leaiana Atkinson." I was under the impression that this plant was named before Atkinson was born.

"Poria tomentocincta B. & Ray." I thought Ray wrote before the days of binomials. I do not know to whom "B." refers. Perhaps it is Belshazzar.

"Calvatia saccata (Vahl.) Morgan." Vahl never called the plant anything whatever, and Morgan never saw it. I guess the advertisement is as good as any, though.

"Geaster fornicatus (Hudson) Fries." Hudson called one plant Lycoperdon fornicatum and Fries called quite a different plant Geaster fornicatus. I never could figure out what is meant by "Geaster fornicatus (Hudson) Fries."

"BOVISTA" SPUMOSA.

As I have not seen this plant I can add nothing to Léveillé's original statement made fifty years ago. It is surely not a Bovista.

"Bovista spumosa, n. s. Peridium globose, thin, clothed with a dense, white cortex, becoming evanescent. Flocci and spores fuscous. Habitat Sumatra, on earth. I make notation of this curious species to awaken the curiosity of botanists who voyage in Sumatra where M. Korthals has found it. This learned naturalist, who has observed it living, states that it is larger than an egg and its peridium is covered with a soft material that resembles that of Spumaria and which disappears at maturity. The peridium which persists then is the size of a walnut."

Léveillé does not seem to have succeeded in "awakening the curiosity of botanists" as nothing more has been written on the subject.

The vast regions of India, East Indies, and Australia are practically *terrae incognitae* as far as "puff-balls" are concerned. The same can be said of South America. It is true that Spegazzini has "described" with abundant verbosity, and "named" numerous "new species" from South America; but it is quite evident from his work that he has not even a passing acquaintance with the "old species."

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 21.

CINCINNATI, O. APRIL, 1906.

NEW NOTES FROM AUSTRALIA.

In April, 1905, we issued a pamphlet concerning the Lycoperdaceae of Australia and New Zealand, and although only a few months have elapsed some interesting specimens have since been received, which merit additional notes.

We have since received at Paris specimens from the following:

Prof. D. McAlpine, Melbourne,
F. M. Reader, Casterton,
J. T. Paul, Grantville,
W. R. Guilfoyle, Melbourne,
Robert Brown, Christchurch, N. Z.

Prof. McAlpine sends a very large assortment, fully one-half as many specimens as have ever reached Europe before, and includes some very interesting species.

Mr. F. M. Reader also sends a fine assortment.

The following notes are based on these specimens. As we have frequent occasion to refer to our previous publication and as its title is somewhat cumbersome to quote, we refer to it in this article as "the pamphlet."

THE GENUS TYLOSTOMA:—We have received fine specimens of this genus from Messrs. McAlpine and Reader, much finer and better than can be found in the museums of Europe. We feel well acquainted with this genus as it occurs in Europe, but the species of the United States and Australia are very little known. We hope shortly to make a close study of the two hundred different collections that have accumulated. It is very difficult to recognize these plants from the work that has been done with them, or from the specimens (mostly fragments) in the museums, on which this work is based.

THE GENUS BATTARREA:—Two remnant specimens have been received from Messrs. Reader and McAlpine. The woody stalk of this plant persists long after the spores have been dissipated, but is easily recognized.

THE GENUS SCLERODERMA:—Several specimens of Scleroderma flavidum have been received and it is evident that it is the common form in Australia. It is even doubtful if either Scleroderma

UNIVERSITY OF CALIFORNIA

aurantium or Scleroderma verrucosum, forms of which are so common in the United States and Europe, occur in Australia. Scleroderma Geaster, which was unknown to me from Australia at the time I wrote the pamphlet, has since been received from Prof. McAlpine. As stated in the pamphlet, Scleroderma Geaster can be considered a thick, black form, and Scleroderma flavidum a thin, yellow form of the same plant.

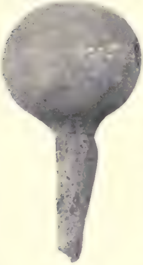

Fig. 88.

SCLERODERMA RADICANS (Fig. 88):—Peridium smooth, firm, pale colored. Gleba dark, bluish-black. Spores globose, 12-14 mic. echinulate, mixed with remnants of the hyphae tissue. Root thick, tapering, surrounded by a peculiar sheath of matted mycelium. This specimen was collected by F. M. Reader "in a hollow, half burned tree, on the banks of the Wimmera." As to the peridium and spore characters, it corresponds to Scleroderma Cepa of Europe, a species not positively known to me from Australia. It differs in habitat, and its marked character is the peculiar sheath surrounding the root. If the future develops that there exists in Australia a plant having this peculiar character habitually, which is quite distinct, then it will merit a name, but on a single specimen it may be only a sport.

THE GENUS GEASTER:—Mr. J. T. Paul sends an expanded specimen of Geaster velutinus as it occurs in the United States, thus establishing the occurrence of this species in Australia. At the time we wrote the pamphlet we supposed that "Geaster dubium" was based on unexpanded specimens of this species, and we feel more sure of it now that the species has been surely authenticated from Australia. Prof. McAlpine sends Geaster striatulus, not previously seen by me from Australia, also Geaster Drummondii of which only one collection was known, made by Drummond many years ago.

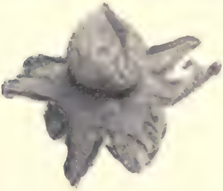

Fig. 89.

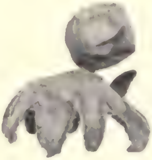

Fig. 90.

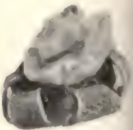

Fig. 91.

GEASTER READERI (Figs. 89, 90 and 91):—In our pamphlet we have referred the specimen on which Geaster Readeri was based as a small form of Geaster rufescens. We are still of this opinion, but the receipt of abundant specimens from Mr. Reader and others convinces us that it is a constant form in Australia, and merits a distinct name. It is a much smaller plant than Geaster rufescens as it occurs in the United States and Europe, darker in color, not so red, the exoperidium is more rigid and the fleshy layer thin and closely adnate. It grows in sandy places. The typical Geaster rufescens has never been collected in Australia. Prof. McAlpine sends what I take to be unexpanded plants of Geaster Readeri, which have the *globose form* characteristic of unexpanded rufescens but much smaller.

THE GENUS CATASTOMA:—Prof. McAlpine sends several scanty collections of Catastomas that are unknown to me. One (a single specimen) opening by a fimbriate mouth such as does not occur in any known species. The genus Catastoma of Australia is very imperfectly known, and much more material must accumulate before anything definite can be done with it.

THE GENUS BOVISTELLA:—Numerous collections of this genus have been received from my Australian correspondents and it is evidently a very common genus in Australia.

BOVISTELLA ASPERA (Plate 33):—Comparison of the specimens received from W. W. Watts with the types from Chile in the museum at Paris shows some slight differences. The cortex of the Australian plant is not so strongly developed; the color of the gleba is olive while in the type it is brown; the pedicels of the spores of the Australian plant are longer. I believe if we had abundant material of the Australian and Chilian plants they would be found to be not exactly the same.

BOVISTELLA BOVISTOIDES (Plate 70):—We have received three collections of this plant, new to the Australian flora. It was originally named Mycenastrum bovistoides (Grev. 16-26) and is compiled in Saccardo as Scleroderma bovistoides.† Plants globose, from 1 to 2 cm. in diameter, devoid of a sterile base. Peridium dark, reddish-brown, flaccid, opening by a definite mouth. Cortex minute, flocculent coat, breaking up into little areas and persistent. Gleba olive when young, dark brown when old. Capillitium of separate threads with pointed branches. Spores globose (5 to 6 mic.) smooth, with long (12 to 16 mic.) slender, persistent pedicels.

Heretofore the plant has been known from a single collection at Kew, made in British India. In external characters it is the same as Bovistella echinella, but is a much larger species and the capillitium characters are entirely different. Bovistella dealbata of the United States is a very similar plant, differing slightly in cortex and spores.

SPECIMENS IN OUR COLLECTION.

Australia, D. McAlpine (3 collections); F. M. Reader.

BOVISTELLA GUNNII (Plate 70);—We have received from Prof. McAlpine a fine collection made by himself and also one made by F. M. Reader, which are very close to the plants at Kew labeled

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†The reference to the genus Mycenastrum is bad enough, as it differs both in capillitium and peridium from that genus, but to refer it to Scleroderma is absurd, as it has no resemblance whatever to Scleroderma in any single character.

Lycoperdon Gunnii, and we prefer to refer to this plant rather than to call it a "new species." However we get from Prof. McAlpine's collections an idea of the plant in its different stages that can not be gained from the Kew collection. The old specimens, if sent separately, would hardly be referred to the same species as the plant changes markedly in appearance when ripe.

Plant globose, 3-4 cm. in diameter, devoid of sterile base. Peridium flaccid, opening by a definite mouth. Cortex a flocculent, woven coat which when old dries up and breaks into areas which persist on the dark, reddish-brown peridium. Gleba olive when young, becoming dark brown when old. Capillitium of long, intertwined, branching threads. While it is not easy to float out separate threads entire, as it is in the previous species, it is possible that they are of the same general nature, only longer and intertwined. Spores globose, 5-6 mic., smooth, with slender, persistent pedicels.

This is a much larger species than the previous, but when old bears a clear, general resemblance to it except in size.

SPECIMENS IN OUR COLLECTION.

Australia, Prof. D. McAlpine, F. M. Reader.

BOVISTELLA AUSTRALIANA (Plates 33 and 70):—An additional abundant collection has been received from J. T. Paul. It appears to be a frequent plant in Australia.

BOVISTELLA SCABRA (Plate 70):—Plant with a well developed sterile base of large cells. Cortex of short, scabrous, connivent spines. Gleba olive umber. Capillitium of Lycoperdon type of long, branched, intertwined, attached threads. Spores globose, 4-5 mic., smooth, with slender pedicels. This plant has the general size, appearance and structure of Bovistella australiana, and differs only in its cortex.

SPECIMENS IN OUR COLLECTION.

Australia, J. G. O. Tepper, F. M. Reader, J. T. Paul.

BOVISTELLA ROSEA:—We give this name provisionally, to a specimen received from J. T. Paul which differs from all species known to me in the color of the gleba which is pale rose color. In other respects it corresponds to Bovistella australiana. Not much stress can be placed on gleba color of a single specimen, but no known species of Bovistella has gleba of a color tending to reddish or purple. We have also labeled a collection from Mr. Paul "Bovistella australiana?" This collection differs from any we have ever seen in the decided yellow color of the gleba.

THE GENUS LYCOPERDON:—Twenty-eight additional collections of this genus have been received, and they confirm the statement in our pamphlet that the common forms in Australia are Lycoperdon pratense and forms of Lycoperdon polymorphum. Of the former we have received three collections; of the latter twenty-four. The forms of polymorphum run mostly to those with a subglobose shape and slight development of the sterile base, called Lycoperdon cepaeforme. Four of them are the black form (Lycoperdon nigrum), a form that seems to be endemic.

The specimens of Lycoperdon pratense received from Prof. McAlpine are so unusually large and well-developed that we present a figure of them (Plate 71). We also give a figure (Plate 71) of Lycoperdon cepaeforme, which from the collections we have received, we judge to be the most common species in Australia. From Prof. McAlpine we have also received typical specimens of Lycoperdon gemmatum (Fig. 92), a species which at the time we wrote our pamphlet we were not sure occurred typically in Australia. It is the common species of most temperate parts of the world, but it seems to be rare in Australia.

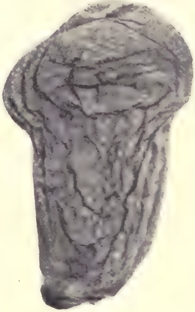
Fig. 92,

LYCOPERDON TEPHRUM:—I have been led to doubt the determination of the specimens called Lycoperdon tephrum in the former pamphlet. They are immature and should not have been determined. I withdraw what I have said on this subject, awaiting further material.

THE GENUS CALVATIA:—The abundant and fine specimens that we have received from Prof. McAlpine and Mr. Reader afford us a much better idea of this genus in Australia than we had at the time we wrote our pamphlet. Calvatia candida proves to be the most frequent species, which is strange, as it is a very rare plant in Europe where I know of only two or three collections, and it is unknown from the American continent.

CALVATIA CANDIDA (Plate 72):—Specimens that we now have are larger with a more strongly developed base, and this plant in Australia is not the little, globose plant such as is only known in Europe. Peridium with a smooth cortex, very thin and brittle, white when young, but becoming reddish-brown when ripe.† Sterile base (when developed), compact, not cellular, similar to the gleba in appearance. Capillitium of slender, *hollow*, branched, *septate* threads, about the diameter of the spores, colored when young, but becoming almost hyaline (under the microscope) when fully ripe. Spores globose, 4-5 mic., minutely but distinctly asperate under a high power.

SPECIMENS IN OUR COLLECTION.

Australia, *Norwood*, J. G. O. Tepper, *Dimboola*, D. McAlpine, (2 collections). *Warracknabeal*, F. M. Reader, *Borung*, F. M. Reader, *Adelaide*, Walter Gill.

CALVATIA OLIVACEA (Plate 72):—We have received two collections. Heretofore the type specimen was all that was known. It is the same as Calvatia candida as to spores and capillitium, excepting that the latter is more strongly colored. In general habits, however, it is a larger plant with a thicker peridium. It has more the appearance of being a small specimen of Calvatia gigantea. A small specimen is well shown in Cooke's Handbook (fig. 118), excepting the spores which are inaccurately shown with a pedicel. The spores of the type are almost smooth. I can detect only the faintest indication of asperity with my highest power.

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†Hence the plant is really mis-named.

Specimens in our Collection.

Australia, From D. McAlpine two collections, near Dimboola, by F. M. Reader.

THE GENUS ARACHNION:—From the vast extent of territory of Australia all that was known of the genus Arachnion was a single specimen, collected more than sixty years ago by Drummond. From Prof. McAlpine we have received an additional specimen of this species, and also a widely different species.

ARACHNION ALBUM (Plates 16 and 73):—When we wrote our pamphlet we considered this under the name given to the Australian plant by Berkeley, viz: Arachnion Drummondii, but on a close comparison of the Australian plant with the well-known species of America, Arachnion album, we are unable to detect any difference whatever. The spores may be a shade larger, but not enough to measure, and as to pedicels they are frequently present in the American plant.

Specimens in our Collection.

Australia, Prof. McAlpine. (We have the plant also in our collection, one collection from Brazil, one from Ecuador and several from the United States.)

ARACHNION RUFUM (Fig. 93):—Peridium dark reddish-brown, with a rough surface and (in these specimens) ovate in shape with an acute point. Gleba brown, composed of little, irregular peridioles, like grains of sand. Peridioles almost naked, consisting of clusters of spores, but not enclosed in a loose web as in the previous species. The spores are probably enclosed in little cells in the young state, but if so, in this species the walls of the peridioles are evidently absorbed in the process of deliquescence. Spores globose, smooth, 5-6 mic.

Fig. 93.

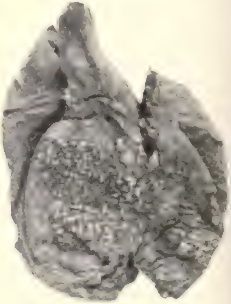
Fig. 93.

This is much the largest species known, with a peridium not so thin and fragile as in other species, but more tough and dehiscing by a lacerated opening. It differs widely from Arachnion album, not only in general appearance, but in the peridioles which are not so uniform in size and have hyphae threads, very scantily.

BOUDIER'S PLATES.

The best illustrations that have ever been produced of the fungi of Europe are now being published by Monsieur Paul Klincksieck, a book-seller of Paris. They are a superb series of colored plates that have been drawn by Monsieur E. Boudier.

Two years ago I had the pleasure to déjeuner with Monsieur Boudier, and I then expressed my appreciation of his work as follows: "He has prepared a series of plates of the fungi of France which, in beauty, in accuracy, in minute technique are unrivaled by any that exist today. Compared to them the usual, published plate of Europe is a cartoon." (Myc. Notes, p. 164).

Monsieur Boudier, in addition to being an authority on mycology, has unusual talent as an artist. This is a combination rarely met. A few good artists, not mycologists, have drawn illustrations of fungi: and many mycologists have issued alleged illustrations of fungi who (judging from their work) could not earn their salt as artists. Monsieur Boudier, in addition to natural artistic talent, has an inexhaustible stock of patience and application in reproducing minute details. The result is a series of plates that, in my opinion, have no equals, except perhaps the magnificent work of the Tulasne brothers.

Monsieur Paul Klincksieck, the publisher of the work, is also entitled to credit for the manner in which the work is issued. The published plates represent the best product of modern lithographic art, and are as nearly perfect as it is possible to make them. I feel assured that the issuing of this work by Monsieur Klincksieck is not a commercial matter purely, but a subject in which he takes personal pride as a publisher, and that he was prompted to undertake it by a just appreciation of the excellence of Boudier's drawings.

The publication has not been a financial success. This is due to a number of causes. It is an expensive work, beyond the reach of the average pocket-book. The publisher, in my opinion, erred in business judgment in requiring an initial subscription to the entire work before he had thoroughly demonstrated the excellence of his reproduction. When the work was begun, two hundred and fifty copies were issued, but when sixty of the subjects had been published, the financial loss was found to be so great that the issue was reduced to one hundred and twenty-five copies, and that number is all that will ever be published. In time the work will become very rare in the book markets. Two series (of the six proposed) will certainly be issued; the first at a considerable loss to the publisher, the second at a heavy expense to the author. Seventy-nine subscribers to the work have been secured. The publisher tells me if he can secure one hundred subscribers, it will just cover the expense of issuing, and the series of six hundred plates will then be completed. It will be to the everlasting discredit of Mycology if this work, the most beautiful, accurate and creditable that was ever originated, should fail for lack of twenty-one subscribers. It is the duty of every mycologist who can afford it to subscribe. If he can not afford it personally, he should urge the library or scientific institution with which he may have influence to secure the work. It costs one hundred and eighty francs per series of one hundred plates,† and the intention was to issue a series each year for six years. The only adverse criticism I have ever heard offered concerning the work is that the plates are expensive. They may be expensive, but certainly the price can not be called excessive when the plates are sold at less than the cost of production, and surely plates of this quality can not be published more cheaply when the artist donates his services as a labor of love. If he were paid a fair price for his work the plates could not be sold for ten times the present price. Aside from their scientific value, these plates merit a place in the art department of every library that maintains an art room, and it is to be hoped that at once twenty-one individuals or libraries will subscribe for the set, thus insuring the completion of the work.

Subscriptions should be sent to Monsieur Paul Klincksieck, 3 rue Corneille, Paris, France.

THE GENUS ARACHNION.

The ideas of the genus Arachnion are derived from the ripe specimens. In these the spores are found to be collected in little balls, called peridioles, which are surrounded by a few, loose, hyphae threads. In the usual American form these threads are relatively numerous, and the peridioles are likened to little sacks. I think the idea is a little overdrawn, for the threads form a loose network at the best, and never I think a true membrane.

In addition, in a new form that has just reached us from Australia, the spores are collected in little, irregular masses with very few surrounding threads, almost naked in fact. And to complicate the question, plants have recently been discovered in Texas and Mexico which we place in another genus, Holocotylon, because the spores are not collected in little, separate masses, but the entire contents of each peridium consist of spores lining irregular and confluent cells, and forming a continuous mass of gleba. The genus Holocotylon is so close to Arachnion in its general nature and habits that it is a question if it were not better to consider it as an Arachnion and to extend the limits of that genus to include it.

The genus Arachnion has always a very thin peridium with a smooth cortex. It breaks irregularly and is so fragile that it is difficult to keep entire ripe specimens in the herbarium. There is no sterile base. The gleba consists of little granular masses of spores called peridioles which in the type species are each surrounded with an imperfect web of hyphae, analagous to the capillitium of other "puff-balls" and for convenience called capillitium. In Arachnion rufum, of Australia and in a form of Arachnion album from Brazil the peridioles are almost devoid of hyphae, almost naked, little balls of spores. The spores are borne on slender sterigmata which in some specimens (not species I think) are partially persistent as pedicels. Usually these pedicels are absorbed in the process of deliquescence, and it is not unusual to note spores in the same specimens with varying remains of the sterigmata.

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† See correction, page 259.

HISTORY.—The genus was described and figured by Schweinitz in 1822[†] from North America, from a single species, Arachnion album, which has since proved to be of wide geographical distribution. Next, Berkeley (Hook. Jour. 1843-417) described under the name Scoleciocarpus tener, a plant from South Africa, which I consider the same as Arachnion album. Next Montagne in 1849 (Ann. Sci. Nat. 3-11-33) described Scoleciocarpus bovista from Chile. In the meantime Berkeley had discovered that his genus Scoleciocarpus was the same as Schweinitz's genus Arachnion and so wrote Montagne who changed his name to Arachnion bovista (Ann. Sci. Nat. 3-12-302) stating it was done on advice from Berkeley.[‡] Next, Berkeley (Jour. Linn. Soc. 18-389) named a single specimen from Australia Arachnion Drummondii. An examination of the above specimens convinces me they do not differ enough to be kept as distinct species and I would refer them all to Arachnion album. During the past summer (1905) I have received specimens of Arachnion album from Rev. L. Badet, Salussola, Italy, which is the *first and only time the genus has ever been known in Europe.*

"Arachnion aurantiacum" is based on Rafinesque's ravings (Acinophora aurantiaca) and is more probably a Scleroderma or a Polysaccum than an Arachnion.

Species of Arachnion.

ARACHNION ALBUM. (Plates 16 and 73).—Peridium, smooth, thin and fragile, never opening by a definite mouth, but breaking irregularly, pale in color, pure white when young. Gleba composed of little grains called peridioles, each consisting of a mass of spores surrounded by a few, loose, hyphae threads (capillitium.) Spores smooth, globose, 5-6 mic. sometimes with fragments of the persistent sterigmata attached. Gleba color in the type form *ash gray.*

FORMS.—We do not consider that the following geographical forms merit distinct names, but note all the differences that we find.

American (type) form.—Hyphae threads slightly colored, rarely we have noted colored threads. Spores rarely pedicellate.

European form.—Threads distinctly colored. Spores mostly pedicellate.

Brazilian form.—Threads very scanty.

Australian form. (A. Drummondii.) Same as American.

South African form (A. tener).—Spores more notably pedicellate.

Chilian form (A. bovista).—Differs from others only in color of gleba, which is *brown* not ash gray.

Geographical Distribution.—Fairly common and widely distributed in North and South America. Known also from one collection each from South Africa, Guadalupe and Europe (Italy), and two from Australia.

SPECIMENS IN OUR COLLECTION.

United States, Texas, W. H. Long, Jr., *Ohio*, A. P. Morgan, C. G. Lloyd, *Massachusetts*, Geo. B. Fessenden.

Australia, Prof. D. McAlpine.

South America, *Brazil*, Rev. J. Rick.

Ecuador, From Herbarium Patouillard.

Europe, *Italy*, Rev. L. Badet.

[†] Synopsis fungorum Carolinae.

[‡] Notwithstanding the author of Scoleciocarpus repudiated his genus very soon after it was proposed, stating it was the same as Arachnion (which it surely is, and in my opinion the same species), and that all this happened more than fifty years ago, the genus Scoleciocarpus is still carried in Saccardo and by Fischer in the recent Engler and Prantl.

ARACHNION RUFUM (Plate 73).—Peridium *reddish brown*, rough with adhering sand (in these specimens) ovate with an acute apex, opening by an irregular aperture. Gleba *brown*, composed of small, irregular, almost naked masses of spores. Hyphae threads very scanty. Spores subglobose; 5-6 mic. smooth, pedicellate. This species differs from the preceding in its thicker, reddish-brown peridium, larger size and gleba which is not so distinctly differentiated into distinct peridioles. It seems to me to connect Arachnion album to the following genus.

SPECIMENS IN OUR COLLECTION.

Australia, Prof. D. McAlpine.

THE GENUS HOLOCOTYLON.

Peridium thin, fragile, breaking irregularly. Sterile base, none. Gleba consisting of a mass of spores lining irregular, confluent cells. Capillitium, none. Spores (in known species) mostly pedicellate. The plants composing this genus are very close to Arachnion in their general habits but differ in the structure of the gleba. This, instead of being in little, separate masses of spores, consists of one confluent, chambered mass. We think our enlarged photograph (Plate 73, figs. 5 and 6) will give a good idea of the structure, but we acknowledge our indebtedness to Prof. Patouillard, who has kindly prepared for us drawings (figs. 94 and 95), illustrating his views of the structure of the gleba†. Fig. 94 represents a portion of the enlarged gleba mass, and fig. 95 the arrangement of the spores. We have received two quite distinct plants belonging to this genus.

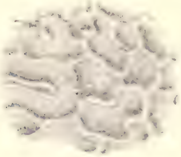

Fig. 94.

Fig. 95.

HOLOCOTYLON BRANDEGEEANUM (Plate 73).—Peridium globose, thin and fragile, *yellow*, breaking irregularly. Gleba mass dark brown. Spores globose, smooth, 5-6. mic. (some) with slender pedicels. The specimens were collected by T. S. Brandegee, of San Diego, California, at Culiacan, Mexico. The plant is very close to the following in its gleba characters, but is a *larger species*, and at once distinguished by its *yellow* peridium.

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†We are afraid that our enlarged photographs of the gleba of Arachnion and Holocotylon do not show the difference that exists as clearly as we would wish. The peridioles of Arachnion adhere together and do not show as separate grains as they really are.

SPECIMENS IN OUR COLLECTION.

Mexico, T. S. Brandegee.

HOLOCOTYLON TEXENSE (Plate 73).—Peridium globose, very thin and fragile, white, breaking irregularly. Gleba mass dark brown. Spores globose, smooth, 4-5 mic. (mostly) with permanent, very thin pedicels. This plant has reached us (two collections) from J. W. Stiles, Huntsville, Texas. In peridium characters, size and general appearance the plant is exactly the same as Arachnion album, but differs in color and structure of the gleba. Fig. 96 represents the plant, natural size, drawn by Prof Patouillard.

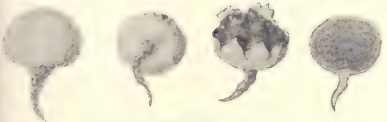


Fig. 96.

SPECIMENS IN OUR COLLECTION.

Texas, J. W. Stiles.

PROFESSOR FARLOW'S WORK.

Undoubtedly the most important and useful work that has ever been issued on American fungi is the "Bibliographical Index of North American Fungi," by William G. Farlow, the first part of which has just been published by The Carnegie Institution of Washington. The references to American fungi are so scattered and fugitive that the bringing together in a systematic form will be a great help and convenience, and no man in America is as competent or as well equipped for a critical editorship of this work as Prof. Farlow. No other man in America has as large a collection as he, and probably no other man in America has devoted more study to the subject. His critical notes will be of inestimable value to American mycologists. The principles of nomenclature, as stated in his preface, have the right ring to them, and we hope they will be strictly carried out without fear or *favor*. We reproduce a few extracts from the preface that impress us as being particularly sound:

"There are two categories of botanists; those who believe that nomenclature is an end rather than a means, to whom the changing of names to adapt them to a uniform, automatic system seems to be the important aim in science; and those who regard nomenclature as a necessary evil which can be mitigated by making as few changes as possible. Of these two categories, it is hardly necessary to say that we should prefer to be classed with the latter."

"It is best not to make too violent attempts to interpret the older mycologists, but to be content with letting the dead bury their dead. The business of reviving corpses has been carried altogether too far in mycology. An examination of some of them at least, shows that they are as inaccurate as they are useless."

We shall feel interested in watching, as the work proceeds, Prof. Farlow's treatment of the "juggled names" of the puff-ball world and shall keep our readers advised.

LE GENRE CALVATIA ET LES "PETITES AFFICHES."

A mon avis, le genre Calvatia est un genre excellent et parfaitement distinct; mais les botanistes français tardent bien à se convertir à cette idée. Il comprend ces grandes " Vesses-de-loup " qui ne s'ouvrent pas par un orifice défini, mais dont le péridium se partage en pièces qui tombent isolément.

Il existe en France quatre espèces de Calvatia : C. gigantea nommé la Vesse-de-loup géante, C. caelata qui semble l'espèce la plus commune, C. saccata à laquelle, selon moi, on donne habituellement en France le nom erroné de Lycoperdon excipuliforme, et le C. lilacina qui semble n'habiter que les régions montagneuses.

Parmi les ouvrages français publiés ces deux dernières années et qui citent la Calvatia gigantea, l'un le nomme Lycoperdon Bovista, l'autre Bovista gigantea. La raison de l'emploi comme nom spécifique du mot Bovista repose sans doute sur quelque application de la loi de priorité : il est vrai que l'application de cette même loi a conduit d'autres auteurs récents à adopter pour la même espèce le nom specifique maxima. C'est le cas, de dire qu'il y a dans la priorité divers degrés comme il y a divers grades dans la Franc Maçonnerie, et les auteurs qui, pour le choix des noms à adopter se basent sur cette loi, arrivent rarement aux mêmes conclusions. A mon avis, le nom gigantea convient parfaitement au Champignon communément appelé Vesse-de-loup géante, et il à pour lui le prestige d'un emploi courant depuis plus d'un siècle. Quant à l'emploi comme nom générique du mot Bovista, ce semble un souvenir des temps reculés où les anciens botanistes se servaient, pour désigner notre plante du simple nom de Bovista. En réalité, cette plante a, dans son peridium, ses spores et son capillitium, des caractères tout différents de ceux qui appartiennent au genre Bovista tel que le comprennent les mycologues de la génération actuelle.

On peut rarement parcourir une liste de Champignons français sans y trouver noté le Lycoperdon excipuliforme. Ce qu'il faut entendre par ce nom, j'ai tout lieu de croire que c'est habituellement le Calvatia saccata. Scopoli a créé le nom de Lycoperdon excipuliforme pour une espèce figurée par Vaillant laquelle es certainement le Lycoperdon gemmatum !! Sans doute la signification première du nom de Scopoli s'est peu à peu obscurcie, car nous trouvons des échantillons de C. saccata étiquetés Lycoperdon excipuliforme dans l'herbier déja ancien de Desvaux. L'erreur s'est propagée jusqu'à nos jours. Il en est ainsi dans plusieurs ouvrages français, en particulier dans celui de Richon et Roze.

Le genre Calvatia est habituellement attribué à Fries et le nom de Fries suit généralement le nom de ce genre. Je remarque fréquement sur les glaces des cafés de Paris l'enseigne " Ici on lit les Petites-Affiches." Je ne regarde jamais cette enseigne sans me rappeler l'usage qu'ont les botanistes de placer leur nom après celui des plantes. Je ne vois pas là autre chose que des " Petites-Affiches." On nous dit que cela permet de retourner en arrière, de remonter jusqu'à l'idée

première du genre et de vérifier si telle plante lui appartient bien. Voyons ce qu'il en est dans le cas actuel.

Schweinitz—un mycologue américain—envoya à Fries un échantillon d'un Champignon. Ne pouvant le faire rentrer dans un genre connu, Fries fit ce que font en pareil cas les botanistes modernes: il se tira d'affaire en créant le novum genus Calvatia. Qu'il n'eût pas l'idée nette de ce genre, cela est de toute évidence, car des plantes ayant des caractères génériques manifestement semblables à ceux de la plante américaine croissent dans la propre patrie de Fries et il ne reconnut pas l'affinité des unes et des autres. Une idée du genre Calvatia dormait pendant plus d'un demi-siècle, quand Morgan—un autre mycologue américain—la reprit, la précisa d'après l'examen d'un échantillon de l'herbier de Schweinitz. Dira-t-on encore qu'on doit accoler le nom de Fries à Calvatia et qu'on doit remonter jusqu'à son ouvrage pour prendre une idée d'un genre dont lui, Fries, n'avait pas idée? Ce cas n'est pas le seul; la littérature botanique est pleine de cas semblables. De là vient que je trouve déplorable le système des "Petites-Affiches."

ERRORS.

It is our aim to have every statement that appears in Mycological Notes in keeping with the truth, and we will gladly correct every error that may be brought to our attention, however slight. We fully believe that at least one-half the past literature of "puff-balls" though very interesting, is not true.

The references on page 225 to "Plate 00 figure 00," etc., are of course, errors due to bad proof-reading. Personally, I am a very poor proof-reader, and this issue, in which the work is left to others, being published in America while I am in Europe, I hope will be free from such obvious errors.

Nothing apparently gives so much fiendish joy to a printer as to slip in a cut of a "puff-ball" and stand it on its head, as figures 80 and 86. From the time the copy goes into his hands until the pamphlet comes from the press, it is a constant war to keep the figures on their feet, and we are not always the victors.

In compiling the Index we noted an error on page 182. It was Vittadini's Lycoperdon tomentosum that was compiled in Saccardo as Bovista tomentosa, not Curry's Lycoperdon tomentosum. We do not know how we happened to make that slip as we knew better at the time.

The statement in the note, page 159, that "the same house in which Persoon lived still remains near the Gare de Lyon" is an error of fact. The street, "rue des Charbonnier," where Persoon lived is not the same street of Paris that bears that name now, as it was located on the other side of the Seine in a quarter that has since been largely reconstructed and its identity lost to the present generation. I thank Monsieur Camus [†] for information on which this correction is made.

The statement on page 244 that Lycoperdon Berkeleyi is a synonym for Calvatia craniiformis is true as stated, but there are two Lycoperdons Berkeleyi, both based on the two Lycoperdons delicatum, and all four are errors.

[†] Monsieur F. Camus has kindly favored me with the following note: "A l'époque où Persoon habitait Paris, il y avait deux rues des Charbonniers. L'une, rue des Charbonniers-Saint-Antoine, existe encore, l'autre - où logeait Persoon - n' existe plus. Elle s'appelait rue des Charbonniers-Saint-Marceau. Elle se trouvait à peu près sur l'emplacement d'une partie de la rue Berthollet actuelle et a été détruite vers 1860, lors du percement du boulevard de Port-royal. La rue des Lyonnais, qui aboutissait à l'ancienne rue des Charbonniers-Saint-Marceau, et qui n'a pas subi de transformations modernes, peut donner une idée—idée plutôt triste—de ce que devait être la rue qu'habitait Persoon."

A LARGE SPECIES OF CYPHELLA.

BY N. PATOUILLARD.

NOTE.—In Samoa there grows densely caespitose on old logs, a beautiful, pure white fungus that was of much interest to me because it seemed to me to belong to a genus with which I was not acquainted. On my return to Paris. I gave it to Professor Patouillard for determination. He states that it belongs to the genus Cyphella, which usually consists of very minute plants, and that he is unable to find the species described. He has named it Cyphella grandis, and has drawn up the following description.—C. G. L.

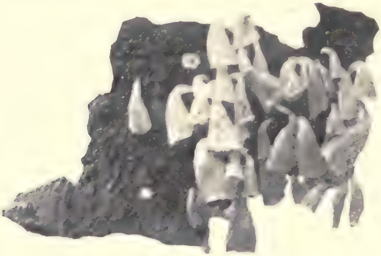


Fig. 97.

CYPHELLA GRANDIS.—Sparsa vel caespitosa, majuscula, 7–25 millim. longa, 4–7 millim. lata, digitaliformis vel cornucopiaeformis, interdum uno latere magis producta, lateraliter stipite cylindraceo, 3–6 millim. longo, 1–2 millim. crasso, adfixa, pendula, margine acuto, integro, repandulo, aperta, glabra, membranacea, candida in vivo dein albido lutesceno, intus extusque laevissima, ex hyphae cylindraceo, 8–15 mic. diam. tenuiter, tunicatis composita. Hab. ad corticem arborum, Samoa.

A NEW BOOK ON COLORS.

Monsieur Klincksieck, No. 3, rue Corneille, Paris announces a book on colors for the naturalist and particularly for the mycologist. No work is more needed in mycology than a good book of colors, and as what Monsieur Klincksieck does he usually does well, we have great hope for the new work. There now exists no work that is of much practical value. Saccardo had the right idea when he issued his little pamphlet, but his color samples were not elaborate enough, nor in all cases accurate enough to be of much service. This was without doubt partly due to the printer, and as Monsieur Klincksieck has a practical knowledge of the printing art, and we think a critical knowledge of colors, we look for something that will be of service.

A SECOTIUM IN SWEDEN.

I collected near Stockholm last summer a single specimen of a little Secotium with large, rough, globose spores. It is the only specimen of this genus ever known to be collected in Sweden. I judge it is Secotium michailowskianum, at least it was a little weak, puny specimen, and I do not know what stunted it unless it was the name. No wonder it is a rare plant. It is strange it managed to survive at all and carry its name.

NOTELETS.

THE PRICE OF BOUDIER'S PLATES.—Since our article, page 251, has been in type, we learn that the publisher has for the third time advanced the price and that now the price is two hundred francs for the first series, and one hundred and eighty francs for subscription to each of the forthcoming series. We feel that this is a mistake, but as there are now only about a dozen subscribers needed to insure the continuance of the work, we are confident the short-sighted policy of the publisher will not result in the untimely death of the undertaking. Boudier's plates are so far superior to any similar series, and are produced in such a superb manner that their very excellence will carry them to a successful finish. The failure to complete the issue would be an irretrievable loss to mycology, and should it occur there will be no trouble or hesitation in placing the responsibility for the failure.

PROFESSOR FARLOW'S STAND ON NOMENCLATURE.—We strongly endorse (and we think the principle is generally endorsed now-a-days) Professor Farlow's position of opposition to unearthing "old corpses" to supplant live names. But we carry the principle further. We do not believe in exhibiting these old remains when others dig them up. When Professor Farlow exhibits "Lycoperdon stellatum, Scop." in its juggled form "Astraeus stellatus (Scop.) Fischer," we are moved to remark that "Lycoperdon stellatum" is indeed a very ancient corpse that lay for more than a hundred years in an unmarked grave until it was recently dug up in Europe. Furthermore that "Lycoperdon stellatum, Scop." never was a respectable corpse, for it never had a corporeal existence, and that "Lycoperdon stellatum, Linn." was such a misshapen production that it died in infancy. It is unfortunate that Professor Fischer used it as he is not the man to dig up corpses on principle, and is not the excavator of this one, and we feel that he merely made a careless slip such as we believe Professor Farlow has made in following him.

CAN SUCH THINGS BE?—We have just received from Dr. Mary S. Whetstone, not only an unknown species, but we think an unknown genus of Gastromycetes, collected in the vicinity of Minneapolis. Had we received it from central Africa, we should not have been surprised, but it is difficult to believe that such things exist in Minnesota. Professor Patouillard is as much interested in studying the specimen as I am, for it seems to have the structure partly of a Polysaccum, but more largely of a Phellorina. It is needless to say it will be further considered in Mycological Notes.

LASIOSPHAERA FENZLII IN JAPAN.—We have received from Professor Atsushi Yasuda, Sendai, Japan, a specimen of Lasiophaera Fenzlii, which is the first time the plant has ever been recorded except from British India and Ceylon. It is a "giant puff ball," and may be taken for Calvatia gigantea (Cfr. Myc. Notes, p. 191 and plate 19). This specimen is young and has subhyaline capillitium but I think it would become colored when ripe. The threads of the Japanese plant are somewhat broader than the Ceylon form and both are septate, a fact I overlooked in drawing the description on page 191.

MITREMYCES IN NEW CALEDONIA.—Professor Patouillard has received a specimen of Mitremyces from New Caledonia, thus extending the geographical limits of this genus. The species is not decided, but it is not Mitremyces fuscus, the only species known from Australia, and which might be expected to grow in New Caledonia.

THE NOMENCLATURE QUESTION.—We have looked in vain in our American journals for a report of what was done at Vienna the past summer on the "Nomenclature Question." We think, however, it was really immaterial, for past history is that botanical congresses meet and make "laws," and then each one of the members who aided in making these laws goes home and does what he pleases, just the same as before the laws were made.

PARALLEL WORK.

The Species of the Genus Disciseda.

By L. Hollós.

The genus Disciseda was already described by Czerniaîev in the year 1845 but his work was little known, so that the greater part of the species have been placed in the externally similar genus Bovista. In the year 1892 Morgan recognized that several of the fungi included in the genus Bovista formed an entirely different genus, but as he did not know of Czerniaîev's work, he placed them in a new genus "Catastoma." I am justified in view of my work on the genera Disciseda to place together as follows the list of fungi which belong according to the descriptions to the genus Disciseda.

Disciseda circumscissa (B. & C.) Hollós.

Disciseda debreceniensis (Hazsl.) Hollós.

Disciseda juglandiformis (Berk.) Hollós.

Disciseda Zeyheri (Berk.) Hollós.

Disciseda hyalothrix (Cooke & Mass.) Hollós.

Disciseda velutina (Berk. & Br.) Hollós.

Disciseda cervina (Berk.) Hollós.

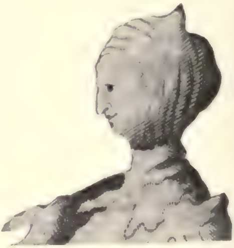
Disciseda pedicellata (Morg.) Hollós.

Disciseda Hollósiana, P. Henn.

The Species of the Genus Anthropomorphus, Seger.

By N. J. McGinty.

The genus Anthropomorphus was described and illustrated by the learned D. George Seger in 1688. I reproduce a copy of his illustration herewith, which although slightly inaccurately drawn will readily be recognized as the first representation of this genus. In the year 1729 Micheli recognized a number of species which, as he did not know of Seger's work he placed in a new genus "Geaster." I am justified therefore in bringing together the following list which according to the descriptions belong to the genus Anthropomorphus.



Anthropomorphus Berkeleyi (Massee) McGinty.

Anthropomorphus Bryantii (Berk.) McGinty.

Anthropomorphus coronatus (Schaeffer) McGinty.

Anthropomorphus Drummondii (Berk.) McGinty.

Anthropomorphus floriformis (Vitt.) McGinty.

Anthropomorphus fornicatus (Huds.) McGinty.

Anthropomorphus fimbriatus (Fries) McGinty.

Anthropomorphus limbatus (Fries) McGinty.

Anthropomorphus mammosus (Chev.) McGinty.

Anthropomorphus minimus (Schw.) McGinty.

Anthropomorphus mirabilis (Mont.) McGinty.

Anthropomorphus rufescens (Fries) McGinty.

NOTE.—We would not wish to undervalue the important discovery that Dr. Hollós has made in regard to the genus Catastoma. In fact we feel that it can not be undervalued. But we would mildly suggest that if the Doctor will take the trouble to look up some of the specimens he would make some additional discoveries. "Disciseda velutina (B. & Br. Hollós" is an unopened Geaster. "Disciseda cervina (Berk.) Hollós" is the same plant as "Disciseda debreceniensis (Hazsl.) Hollós," and something like thirty-four years "prior" and it is not the "priorest" name at that. After publishing to the world that he knew enough of "Bovista juglandiformis" to *change its name* (and add his own to it) the Doctor finds a specimen in the museum at Berlin which he assures Dr. Hennings is absolutely new to science, and Dr. Hennings in gratitude for such valuable information calls the plant Disciseda Hollosiana. If the specimens of "Bovista juglandiformis" at Kew and "Disciseda Hollosiana" at Berlin should ever get transposed no living man could ever tell which is which. But Dr. Hollós is not alone in his discoveries. Professor McGinty, of Poseyville, has recently been making some abstruse investigations, with the aid of a date dictionary, and has unearthed the original reference to the genus Geaster. In view of the value of such scholarly work we present them to our readers in convenient form for comparison.—C. G. L.

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 22.

CINCINNATI, O. JULY, 1906.

SUR QUELQUES RARES GASTÉROMYCÈTES EUROPÉENS.

Nous publions cet article en français, parce que, dans nos efforts pour identifier avec sûreté nos échantillons, nous avons été particulièrement aidé et encouragé par les nations européennes parlant la langue française. Toutefois la rédaction en français de cet article ne nous appartient pas. Nous lisons facilement le français et le parlons de manière à être compris ; mais nous ne pourrions l'écrire avec assez de correction. Un cryptogamiste parisien a bien voulu traduire en français le texte anglais que nous avions rédigé.

Les Gastéromycètes européens n'ont jamais été l'objet d'une étude approfondie. Il suffit d'en récolter un certain nombre, de les comparer et analyser pour reconnaître qu'il en existe de nombreuses espèces ou formes non mentionnées dans les livres. Durant la bonne saison de l'année dernière (1905), j'ai vivement attiré l'attention de mes correspondants sur la récolte des Gastéromycètes, les priant de m'envoyer tous ceux qu'ils pourraient trouver. Cinquantesept (57) collecteurs se sont intéressés au sujet, et leurs envois se chiffrent par 397 numéros. Naturellement la plupart de ceux-ci appartiennent à des espèces communes et bien connues en Europe ; mais il se trouve parmi eux un nombre important d'espèces rares et intéressantes recueillies en Europe *pour la première fois:* Bovistella ohiensis, B. echinella, Arachnion album. Nous croyons qu'il y a un certain intérêt scientifique à donner quelques détails sur les espèces rares qui nous ont été envoyées ainsi que sur celles que nous avons rencontrées dans les Muséums européens. J'ai été sollicité de publier un précis systématique des Gastéromycètes d'Europe. Je trouve le sujet encore trop insuffisamment débrouillé pour me rendre à cette demande. Que ceux qui reçoivent nos publications continuent à m'envoyer des matériaux sur la question, et, d'ici à quelques années, je pourrai entreprendre ce travail avec des spécimens suffisamment nombreux et étudiés pour le mener à bonne fin. Je me borne, dans les pages suivantes, à passer en revue certaines espèces rares de Gastéromycètes européens.

ARACHNION ALBUM (Planches 16 et 73).—Cette plante a été étudiée en détail dans le dernier numéro paru des Mycological Notes. Sa découverte en Europe par l'abbé Badet (Salussola. Italie)

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est assurément le plus intéressant de tous les faits nouveaux mis au jour par les recherches de la saison dernière. Jusqu'ici cette espèce était connue des deux Amériques où elle est fréquente, de l'Australie et de l'Afrique du Sud, où elle est beaucoup plus rare: Elle n'avait jamais été vue en Europe.

GENRE BOVISTELLA.—Ce genre étant l'objet d'une étude détaillée dans le prochain numéro et immédiatement après le present mémoire, il ne sera ici question que de sa présence en Europe. C'est assurément le genre le mieux représenté dans ma région natale (Cincinnati, Etats-Unis) ; mais en Europe, il est méconnu, sinon inconnu, bien que représenté par six espèces, *toutes*, il est vrai, *très rares*.

BOVISTELLA RADICATA (Planche 87).—Cette plante peut être considérée tout au plus comme une forme géographique du Bovistella ohiensis, l'espèce la plus commune aux États-Unis. On ne peut noter comme différence dans la plante européenne que des epines corticales plus consistantes et plus roides, celles de la plante américaine étant plus molles et tombant plus facilement. Le pédicelle des spores est également plus développé dans la plante américaine, mais on ne saurait voir là des différences spécifiques. Ce Champignon a été figuré par Montagne, il y a bien des années, sous le nom de Lycoperdon radicatum, d'après des spécimens algériens. Il a été recueilli plus récemment en Tunisie par M. Patouillard; mais il était encore inconnu en Europe. Je l'ai reçu l'été dernier, en même temps de M. l'abbé Mérino (Galicie, Espagne) et de M. le professeur Plöttner (Rathenow, Allemagne) qui l'a trouvé "in einem lichten Eichenwälde."

BOVISTELLA AMMOPHILA (Planche 87).—C'est une très rare espèce, découverte en France, et qui ne m'est connue que par les exemplaires originaux conservés au Muséum de Paris et à Kew. Elle a été trouvée en 1849, à la Teste-de-Buch près de Bordeaux (departement de la Gironde, France) par Léveillé. On l'a également signalée en Angleterre et en Californie; mais ces deux indications reposent sur des erreurs de détermination.

BOVISTELLA PALUDOSA (Planche 87).—C'est encore une espèce très rare, connue seulement par un énchantillon incomplet recueilli par Léveillé à Malesherbes (departement du Loiret, France) et conservé au Muséum du Paris.

BOVISTELLA PEDICELLATA (Planche 88).—Cette espèce qui, lors de sa première indication en Europe, fut dénommée Lycoperdon caudatum, est plutôt rare, et son aire géographique surtout septentrionale. J'ai reçu des spécimens européens de M. L. Romell (Stockholm, Suède) et de M. le professeur Plöttner (Rathenow, Allemagne). Le seul pays où elle soit commune est le Canada.

BOVISTELLA ECHINELLA (Planche 89).—La découverte en Europe, l'été dernier, de cette espèce est d'un grand intérêt. Elle est due au Rév. Père A. Breitung (Danemarck). Cette curieuse petite espèce a une large distribution sur le globe, mais elle est rare partout. Les spécimens originaux proviennent de l'Equateur et j'en dois quelques uns à l'amabilité de M. Patouillard. Je l'ai reçue, en outre du

Rév. Père Breitung (Danemarck), de B. O. Longyear (Michigan), W. N. Suksdorf (Washington), J. N. Rose (Mexique) et W. Jekyll (Jamaïque)† Tous ces pays sont fort éloignés les uns des autres.

GENRE BOVISTA.—Les deux espèces communes en Europe sont le Bovista plumbea et le Bovista nigrescens. M. R. Maire m'a envoyé de Grèce une forme bronzée du Bovista nigrescens qui correspond à la forme bronzée du Bovista Pila, commune aux États-Unis (Cfr. Myc. Notes, p. 117). Le professeur Massalongo (Italie) et le professeur Rompel (Suisse) m'ont envoyé le Bovista brunnea semblable à la plante de la Nouvelle-Zélande ainsi nommée par Berkeley. Ce n'est pour moi qu'une forme brune du Bovista plumbea. Le Bovista tomentosa a toujours été pour moi une espèce douteuse, bien que considéré comme spécifiquement distinct par M. l'abbé Bresadola. Les spécimens qu'il a eu la bonté de m'envoyer sont très voisins du Bovista plumbea, mais en diffèrent par leur exoperidium dont la surface est mate et terne, celle du Bovista plumbea étant plutôt lisse et polie. Ils ne sont pas "*tomenteux.*" Si ces spécimens sont vraiment bien nommés, les figures de Quélet et de Vittadini ont fortement exagéré ce caractère. Les spores de cette espèce sont dites très finement rugueuses: mon objectif ne m'a rien montré de semblable.

CATASTOMA SUBTERRANEUM (Planche 7 et Fig 98).—Cette espèce, fréquente en Hongrie, en Russie, et peut-être en Italie, est très rare dans le reste de l'Europe. Je l'ai reçue de M. l'abbé H. Bourdet (département de l'Allier, France) (Fig. 98) et de M. Bezzi, (Italie). Les seuls autres spécimens, à moi connus de l'Europe occidentale, sont dans l'herbier de Tulasne qui les avait recueillis aux environs de Paris en 1844 et en 1850. Ce champignon avait été appelé par Vittadini Lycoperdon defossum et on a proposé de changer Catastoma subterraneum en C. defossum, changement que je désapprouve complètement. Si l'on adopte le genre de Morgan, il faut adopter sans changement le nom complet qu'il a donné à l'espèce. Substituer defossum à subterraneum n'a aucun avantage, car defossum est loin d'être le premier nom spécifique de notre Champignon. Quoique rare dans l'Europe occidentale, le Catastoma subterraneum est commun dans beaucoup de parties du Globe et aucune autre Vesse-de-loup n'a reçu autant de noms.

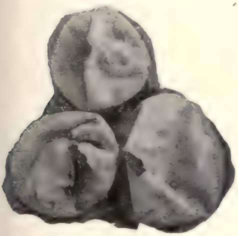

Fig. 98.

GEASTER INFREQUENS (Fig. 99).—M. le R. P. A. Luisier, m'a envoyé un Geaster que je n'avais jamais vu auparavant: il mérite donc bien le nom que je lui donnè Geaster infréquens.

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† Nous devons corriger une erreur faite à propos des specimens reçus de M. Jekyll, signalés p. 118, sous le nom de Bovistella aspera, et figurés, sous ce même nom, pl. 4. Nous avons pu, en faisant une étude comparative des deux espèces, nous assurer que ces spécimens appartiennent au Bovistella echinella. Le Bovistella aspera (Cf. Pl. 33) a des spores et un capillium identiques, mais c'est une plante de plus grande taille avec des épines corticales beaucoup lus fortes.

Exoperidium *lisse,* pâle, mince, divisé au-dessus du milieu en 6-8 segments aigus. Endoperidium *sessile,* brun-rougeâtre, à bouche *indéterminée.*

Ce champignon a le même endoperidium que l'espèce commune d'Europe Geaster fimbriatus; mais il en diffère par son exoperidium et par sa couleur. L'exoperidium du Geaster infrequens est mince et lisse et ne porte aucune trace d'une couche mycélienne, comme c'est le cas dans la section des Rigidæ; mais, à l'encontre de ce qui existe chez les espèces de cette section; il n'est que très légèrement hygrométrique. La moitié inférieure de l'exoperidium enserre fortement l'endoperidium et les segments sont connivents et non recourbés en bas. L'exoperidium du Geaster fimbriatus est recourbé-révoluté à l'état de complet étalement et l'endoperidium en occupe la base creusée en forme de coupe. De plus, cette espèce est rouge foncé et a d'ordinaire une couche mycélienne adnée.

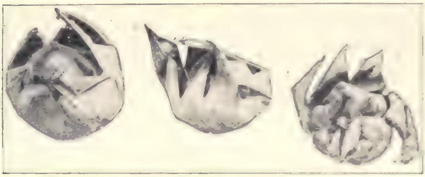

Fig. 99.

Le Geaster infrequens est très voisin du Geaster fimbriatus et je le considère comme une sous-espèce.

Les spécimens originaux sont dans ma collection et proviennent du Tirol, récoltés par le R. P. A. Luisier.

GENRE BATTARREA.—Ce genre est rare dans l'Europe occidentale. Il paraît se montrer très rarement en Angleterre où il a été plusieurs fois indiqué; mais je n'ai vu aucune preuve du fait. On ne lui connaît qu'une localité française. M. Ernest Olivier a découvert le Battarrea phalloides (Planche 28) en 1892, près de Moulins (Allier, France) dans la cavité d'un chêne en décomposition. Depuis il a reparu chaque année à la même place. J'en possède des spécimens reçus de M. Olivier et aussi de M. l'abbé H. Bourdet.

GENRE CALVATIA.—Ce genre est peu connu en Europe, à en juger par les livres. Il y a cependant en Europe deux espèces communes de Calvatia, Calvatia cælata et Calvatia saccata, deux espèces moins communes, Calvatia gigantea, et Calvatia lilacina et au moins deux autres espèces, celles-là rares, Calvatia candida et Calvatia lateritia.

CALVATIA CANDIDA (Planches 35 et 72).—Cette plante a été rarement récoltée près de Berlin par le Dr. Hennings et en Hongrie par le Dr. Hollós. En Australie, c'est l'espèce la plus commune.

CALVATIA LATERITIA.—Cette plante n'a jamais été récoltée qu'une fois, et il y a de cela bien longtemps, près de Montpellier, par Delile, qui l'envoya à Montagne, dans l'herbier duquel elle est conservée. Les échantillons en sont bien maigres, et depuis, aucun botaniste n'a pu la retrouver ni la signaler. Un échantillon envoyé à Berkeley a été décrit dernièrement comme Bovista lateritia de provenance inconnue.

bien que ce ne soit pas un Bovista et que la localité soit écrite tout au long sur l'etiquette. Ce Champignon est très nettement caractérisé par sa gleba rouge brique, ses spores rugueuses et son capillitium coloré.

CALVATIA (Sp. ?).—Nous avons reçu du professeur de Aranzadi (Barcelone, Espagne) un Calvatia que nous croyons non décrit. A l'état jeune, sa gleba est jaune clair, mais elle devient pourpre foncé avec l'âge, ses spores sont lisses et son capillitium fortement coloré. Nous désirons approfondir plus complètement la question Calvatia avant de lui donner un nom. Les Calvatia paraissent très répandus sur la terre entière, mais ils sont mal connus et généralement nommés Lycoperdon.

CALVATIA? SPEC?—Nous avons reçu du Dr. Otto Harz (Bavière) un échantillon qui paraît très voisin, quant à l'exterieur, du Calvatia saccata, mais qui a des spores lisses. Il n'est pas à l'état de maturité complète, et nous ne pouvons affirmer si c'est un Calvatia ou un Lycoperdon. Nous croyons qu'il appartient au Lycoperdon excipuliforme tel que l'entend le Dr. Hollós; mais, comme nous l'avons plusieurs fois établi, si c'est vraiment une bonne espèce, elle doit prendre un autre nom.

GENRE LYCOPERDON.—Il y a moins d'un an que nous avons publié un exposé détaillé de tous les Lycoperdons d'Europe connus de nous. Depuis lors, nous en avons reçu un certain nombre de formes nouvelles.

LYCOPERDON TURBINATUM (Figures 100 et 101).—Nous nommerons ainsi une forme de Lycoperdon gemmatum reçue d'un expéditeur inconnu. "Vale of Thuyd N.—Wales." Aucune plante n'est plus variable que le Lycoperdon gemmatum; mais peu de ses formes sont assez distinctes pour mériter un nom, même comme forme. Toutefois, notre échantillon a une forme turbinée particulière que l'on rencontre rarement. Le nom de Lycoperdon turbinatum a déjà été employé par un ancien botaniste; mais comme personne ne sait quelle est la plante qu'il désigne, nous croyons pouvoir l'employer à nouveau, en lui donnant un sens nettement défini.

LYCOPERDON MACROGEMMATUM (Figures 102 et 103 et cortex grossi 104).—Forme du Lycoperdon gemmatum reçue du Dr. Harz (Bavière) avec de grosses verrues beaucoup plus épaisses et plus longues que d'ordinaire. Nous estimons que cette forme mérite un nom particulier. En outre du caractère des verrues, ses spores sont notablement plus grosses et plus fortement verruqueuses.

LYCOPERDON CUPRICOLOR.—Nous avons reçu deux fois du R. P. Breitung (Danemarck) une forme de Lycoperdon piriforme caractérisée par une belle couleur cuivrée. C'est la première fois que nous avons l'occasion de constater cette couleur chez le Lycoperdon piriforme dont les formes jaunes ne sont pas rares.

LYCOPERDONS DIVERS.—Nous avons reçu de temps en temps bon nombre de Lycoperdons que nous ne pouvons rapporter avec certitude à aucune espèce connue· Nous croyons prudent de ne pas attribuer de noms à des plantes sur un unique échantillon. (Cfr. Myc. Notes p. 127.)

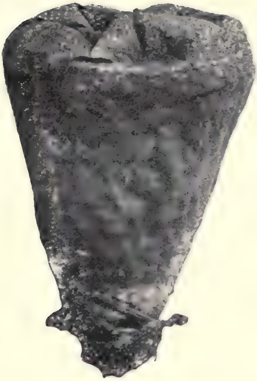

Fig. 100.

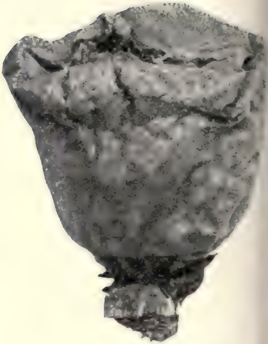

Fig. 101.

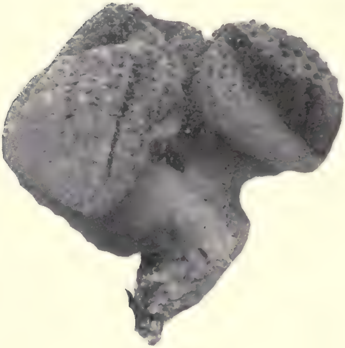

Fig. 102.

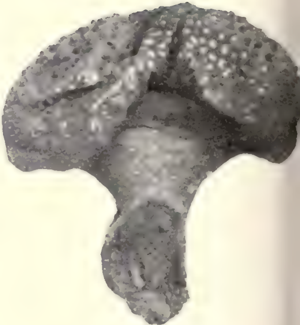

Fig. 103.

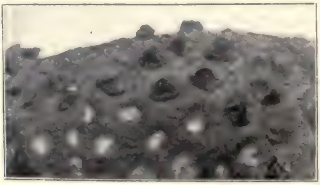

Fig. 104.

Le Dr. Otto Harz (Bavière) nous a envoyé un Champignon (Fig. 105 et cortex grossi 106) qui est évidemment une forme du Lycoperdon piriforme, mais dont le cortex est fortement développé. Dans cette espèce, nous avons decrit le cortex comme portant de très petites ~~épines~~ : ici elles sont développées au point que la description ordinaire ne semble pas convenir à l'échantillon.

Le professeur Jos. Rompel nous a envoyé un échantillon (Fig. 107) qui porte de grandes verrues gemmacées, mais dont la gleba appartient au type atropurpureum.

A Madame Schultze-Wege (Allemagne) nous devons un échantillon (Fig. 108) qui est probablement une forme du Lyc. gemmatum, mais dont le cortex a disparu et chez lequel la surface de l'endoperidium porte de profondes dépressions.

A Monsieur C. Engelke (Allemagne) un échantillon qui, avec le cortex du piriforme, a la forme et les spores du gemmatum.

Nous devons au Prof. Massalongo (Italie) un Champignon (Fig. 109) qui est évidemment une espèce nouvelle. Il a une forme globuleuse, une base stérile peu développée, à larges cellules, un cortex mou et facilement dénudé. Cette plante n'est pas arrivée à maturité; mais la gleba est certainement pourpre lors du complet développement, avec les grandes spores rugueuses du type umbrinum.

Le Prof. R. Maire (Nancy, France) nous a communiqué un spécimen (Fig. 110) qui représente évidemment une forme de Lycoperdon atropurpureum avec un cortex fortement développé, très voisin de ce qu'on appelle en Amérique Lyc. stellare. Je présume que c'est ce que Persoon nommait Lycoperdon hirtum.

Le Prof. Mario Bezzi (Italie) nous a envoyé un Champignon que, si nous l'avions reçu des Etats-Unis, nous aurions appelé Lycoperdon Turneri (Cfr. Myc. Notes p. 236).

Le Prof. R. Maire nous a envoyé de Grèce une plante qui est probablement une forme apprauvrie du Lyc. pratense. Elle a, au plus, la taille du Lyc. Wrightii des Etats-Unis, espèce qui, croyons-nous, n'existe pas en Europe.

MYCENASTRUM CORIUM.—Je considère comme rare dans l'ouest de l'Europe cette plante que je n'ai jamais reçue d'aucun correspondant. Desvaux en recueillit en 1841 trois spécimens, dans les sables de la côte, au Croisic (Loire-Inférieure, France). Longtemps après, Léveillé en trouva un exemplaire au bois de Boulogne (Paris). Enfin l'été dernier, M. Patouillard l'a recueilli à Neuilly près de Paris, dans un jardin. Elle a été récoltée trois fois en Suède, par Elias Fries à Malmö, et par L. Romell et le Dr. O. Juel à Stockholm. En dehors de la France et de la Suède, je n'en ai vu aucune récolte faite dans l'Europe occidentale.

MYCENASTRUM (SP. ?) (Fig. 111).—Le professeur F. Cavara m'a envoyé un Gastéromycète que je considère comme devant sûrement constituer une espèce nouvelle; mais je suis embarassé sur la place véritable qu'il doit avoir dans la classification. Avec les traits généraux, le péridium et l'absence de base stérile d'un Mycenastrum, il a plutôt le capillitium d'un Calvatia. Il a les caractères généraux du Mycenastrum caelatum de la Martinique, mais son capillitium est différent. Ce capillitium est semblable à celui de quelques plantes rangées maintenant dans le genre Mycenatrum, viz. M. fragile et M. Dugesii.

SCLERODERMA VENOSUM.—N'a jamais été recueilli que par son inventeur. C'est pour nous un état du Scleroderma Cepa.

SECOTIUM ACUMINATUM.—Espèce commune en Russie, en Hongrie et en Algérie, mais qui, autant que nous sachions, n'est connue dans l'Europe occidentale que par deux récoltes faites en Italie en 1864 et en 1868. Ces plantes ont été distribuées comme Secotium Ma-

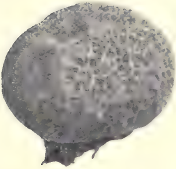

Fig. 105.

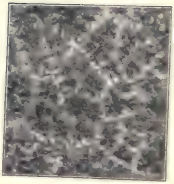

Fig. 106.

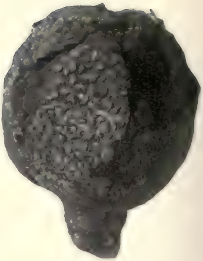

Fig 107.

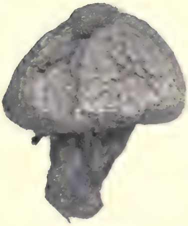

Fig. 108.

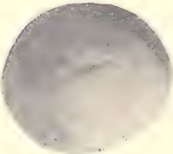

Fig. 109.

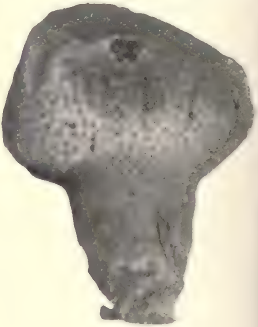

Fig. 110.

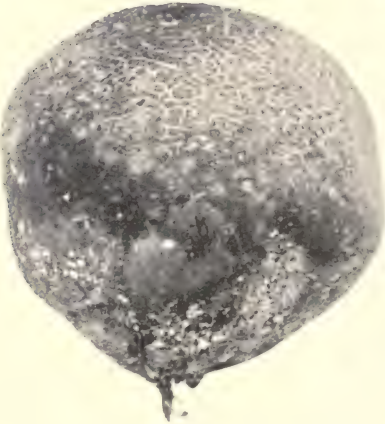

Fig. 111.

linvernianum, et on leur a attribué des spores sphériques. Elles ne nous paraissent différer en rien du S. acuminatum: leurs spores ne sont pas "sphériques" mais nettement ovales et absolument semblables à celles de la plante type.

SECOTIUM OLBIUM.—Espèce recueillie une seule fois et paraissant très rare. Elle croît sur les feuilles tombées du chêne. Elle a été trouvée en 1844 par Tulasne à Hyères (département du Var, France). Elle n'est indiquée ailleurs que près de Florence (Italie) par Saccardo, mais nous ignorons d'après quelle autorité. Le spécimen original qui existe dans l'herbier de Tulasne au Museum de Paris, est réduit à un petit morceau de gleba, pas plus gros qu'un grain de millet; mais grâce aux splendides figures et à la description données par Tulasne, cette plante est aussi bien connue que si elle était représentée en nature dans tous les Museums d'Europe. Si les auteurs présentaient leurs espèces nouvelles d'une si belle façon que l'ont fait les frères Tulasne dans leur ouvrage, le littérature mycologique ne serait pas si compliquée: ce serait, au contraire, la plus précise et la plus claire.

GENRE TYLOSTOMA.—Un bon nombre d'espèces rares de Tylostoma ont été décrites récemment (Ann. myc. 1904) qui nous sont en majeure partie inconnues. Elles semblent avoir été bien représentées et seront, pensons-nous, facilement reconnues d'après les figures publiées.

CONCLUSION.—Nous croyons que, d'une façon générale, les Mycologues européens n'ont pas accordé une attention suffisante à la flore gastéromycétale. Si ceux qui liront ce mémoire veulent bien recueillir tous les exemplaires qu'ils rencontreront, d'ici à quelques années, nos connaissances sur la question seront beaucoup plus avancées. Il n'y a aucune région de l'Europe où ces plantes soient moins connues que l'Italie, la France méridionale, l'Espagne et le Portugal.

EASTERN STATIONS FOR WESTERN PLANTS.

We have received from R. B. Mackintosh, Peabody, Mass., two "puff balls" of interest in establishing the occurrence in the east of species heretofore supposed to grow only in the west.

SECOTIUM ACUMINATUM (Cfr. Myc. Notes, p. 138, Plate 13).—Mr. Mackintosh found this growing "on refuse thrown out of a cattle yard at the freight station," hence it is probably introduced from the west. It will be of interest to learn if in future years it becomes established in the east. In our account of the distribution of this plant, we have stated (p. 139): "It reaches us from almost all sections of the United States except the Eastern States."

BOVISTELLA OHIENSIS.—In our article on this species we state: "This is a very common species in the United States and of a southern range. It occurs from Washington, D. C., west to Missouri, and all over the Southern States. It is not found in the extreme east,

north, or west." Since the above has been in type, we received from Mr. Mackintosh a specimen collected near Boston. Whether it is a late introduction or an established plant we do not know, but it is certainly very rare in the east. In this connection it may not be amiss to state that previous to the past year (1905) the plant was unknown in Europe and that two of my European correspondents sent me specimens, Rev. Merino, Spain, and Professor Plöttner, Germany. It is one of three "puff balls" I was enabled last year to point out as growing in Europe, of the occurrence of which in their country the European mycologists knew nothing.

A NOVELTY FROM MINNESOTA.

Had any one told me that I would receive from Minnesota a Gastromyces of a type that can not be included in any known genus, I should certainly have thought he was imagining a great deal. But we have such a plant from Dr. Mary S. Whetstone, the secretary of the Minneapolis Mycological Club, which forms a new genus which we are pleased to designate under the name Whetstonia.

WHETSTONIA.—Peridium stalked, distinct from the stalk by a definite membrane. Gleba consisting of spores contained in persistent cells. Capillitium none.

WHETSTONIA STROBILIFORMIS (Plate 90).—Peridium distinct from the stem, thick, consisting of a single layer and cracking into large, thick, angular scales, prolonged at the base and forming a rough collar around the top of the stem. In dehiscing it breaks into large, irregular pieces. Stalk thick, bulbose, hard, of a firm, sub-woody texture, hollow (in this specimen). Gleba rust color, composed of persistent cells containing the spores. The walls of the gleba cells are thin, flaccid, and in the ripe gleba imperfect and torn. Spores globose, 5-7 mic., coarsely warted. Capillitium none.[†] Basidia clustered, persistent in the ripe gleba.[‡]

This plant is most closely allied to the genus Phellorina, from which it differs in the permanent cells of the gleba. In general appearance it resembles Phellorina strobilina of Australia. The only plant we have in America that has even a general resemblance to it is Polysaccum crassipes, but the genus Polysaccum is not related in structural characters to the genus Whetstonia. I consider it the most noteworthy novelty in the Gastromycetes in America excepting the curious Dictyocephalos curvatus. The plate (90) will be distributed with the next issue.

[†] The hyphæ of the peridiole walls found mixed with the spores must not be mistaken for capillitium.

[‡] This character of persistent basidia was first pointed out to me by Professor Patouillard. It represents a type of structure entirely different from what is found in the Lycoperdeæ, Sclerodermeæ and most genera of the Gastromycetes. When the genera of Gastromycetes are classed into natural sections by basidial characters as the Tremellæ are now classed, genera with this type of basidia will form a distinct section. The following are all the genera now known to have this type of basidia: Podaxon, Phellorina, Chlamydopus, Dictyocephalos and Whetstonia.

THE GENUS HOLOCOTYLON.

Since the publication of this genus we have received additional abundant material of Holocotylon Texense from J. W. Stiles, Huntsville, Texas. These specimens fully confirm the marked distinction of the genus Holocotylon from Arachnion, which at one time we were disposed to doubt on account of their close general resemblance. Fig. 112 made from the *ripe gleba* (enlarged ten diameters) will give a good idea of the gleba structure of the genus Holocotylon. Mr. Stiles also finds Arachnion album and writes me: "These two plants, Nos. 1 and 2 (Holocotylon Texense and Arachnion album) very much resemble each other in external appearance and habits of growth. They were collected within fifty yards of each other but in entirely different groups and unmixed." Several years ago we received from Martinez Solerzano, Morelia, Mexico, some young specimens that we were unable to locate. They evidently belong to the genus Holocotylon and the photograph (Fig. 113 enlarged four diameters) will give a better idea of the structure of the gleba of Holocotylon than our previous figures. Mr. Solerzano's specimens are about the same size as Holocotylon Texense, and may be young of this species, but they seem much firmer in texture and we desire to see ripe specimens before forming any opinion as to their specific place.

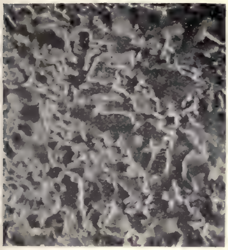

Fig. 112.

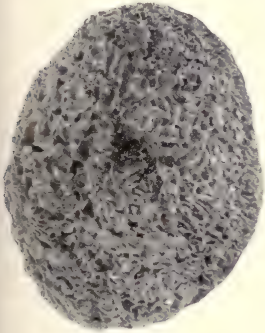

Fig. 113.

LYCOPERDON WRIGHTII IN AFRICA AND JAVA.

We have just received from Dr. K. Braun, German East Africa, a collection of this unique little species, hitherto only known from the United States. The large, hyaline, flaccid, septate capillitium such as no other species typically has, readily characterizes the plant. The African plant differs from the American in one character which to my mind is not material. The American plant has smooth spores; the African plant has spores which under a high power are *very slightly* rough. I might therefore base on it a "new species" on the same principle that the wonderful Lycoperdon pseudo-pusillum was recently

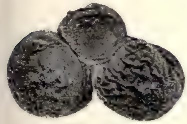

Fig. 114.

discovered in America. I feel, however, it is much more in the interest of truth to record from Africa a plant hitherto only known from America than to embarrass the literature of the subject with these imaginary "new species." The same plant has recently arrived at the Museum of Paris from Java, and it is probable when the distribution of the "puff balls" of the world becomes known, it will be found to be widely distributed, but it is of interest to know that this species *has never been collected in Europe.* If it occurs in South America, which is strongly probable, it masquerades no doubt as one of Spegazzini's "new species."

TYLOSTOMA BERTEROANUM.

We omitted this species from our recent pamphlet of the Tylostomeæ as at that time we did not have material to satisfactorily illustrate it. The type specimen in the herbarium of Montagne while sufficient to identify the species on comparison, is hardly sufficient for illustration. During a recent visit to Kew we found ample material of the plant, collected in Brazil, by Glaziou, and Professor Massee kindly gave us a specimen from which our figures have been made. We have also seen the same collection in the museum at Berlin. One of these collections was determined Tylostoma mammosum, the other Tylostoma fimbriatum, both evidently in error, as no species with such a mouth grows in Europe, although I think Dr. Hóllos has used these South American plants to illustrate the mouth characters of "Tylostoma fimbriatum, Fries."

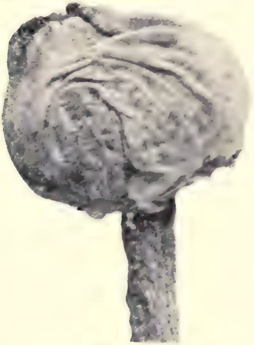

Fig. 115.

TYLOSTOMA BERTEROANUM (Fig. 116 natural size, Fig. 115 enlarged four diameters).—Stipe dark, faintly scaly. Cortex mostly peeling away, leaving the peridium smooth-furfuraceous. Mouth indefinite, fibrillose.† Capillitium thick, subhyaline threads, 12-15 mic. broad, with rather scanty, swollen septa. Spores globose, slightly rough. The collections of Glaziou are two or three times as large as the original type specimens from Chile (Bertero 724) but on comparison, as they have the same peculiar mouth, spores and capillitium, we think they are the same species.

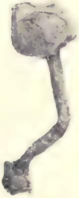

Fig. 116.

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† This is the type of mouth known as "fimbriate" in the Geasters, and is rare in the genus Tylostoma. It does not occur in any species known from North America or Europe.

UN MITREMYCES DE LA NOUVELLE CALÉDONIE.

PAR N. PATOUILLARD.

Le genre *Mitremyces* n'était pas représenté jusqu'ici en Nouvelle Calédonie. Monsieur Le Rat, botaniste zélé auquel la flore mycologique de cette région est redevable de plusieurs formes intéressantes ou nouvelles, a recueilli au sommet du Mont Mou à 1219 mètres d'altitude, quelques spécimens d'une espèce particulière, différente des congéneres.

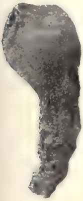
Fig. 117.

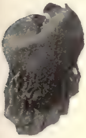
Fig. 117.

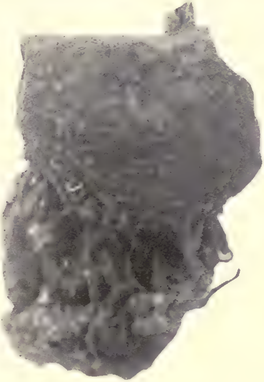
Fig. 118.

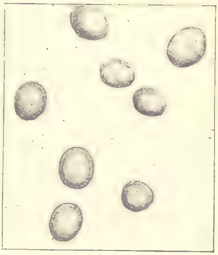
Fig. 119.

Ce champignon (fig. 117) que nous désignerons sous le nom de Mitremyces Le Rati, se distingue au premier coup d'oeil par l'aspect de son peridium. Celui-ci est marqué sur toute sa surface (voir fig. 118, gross. 4 fois), mais principalement dans sa moitié supérieure, de petites dépressions circulaires bordées chacune par un cercle de petites verrues brunes et anguleuses. Cette disposition donne à la plante un peu de l'apparence du *Lycoperdon gemmatum* et ne se rencontre pas sur les espèces similaires.

Le peridium est arrondi, large de 10-12 millimètres, de couleur jaune d'ambre, sauf l'ostiole qui est rouge. Les spores (fig. 119) sont ovoïdes presque rondes et leur paroi est légèrement aspérulée; leurs dimensions varient de 9 à 12 μ de longueur sur 8 à 10 μ d'épaisseur, les mesures 10 × 12 μ étant les plus fréquentes, celles 10 × 10, 10 × 9 ou 12 × 8 ne se rencontrant que plus rarement.

La paroi du sac contenant les spores est formée de filaments linéaires, bosselés, courts, se désarticulant facilement, de 7 à 10 μ de diamètre, épais et réfringents.

Mitremyces Le Rati, pusillus, subglobosus, 10–12 millim. latus; exoperidio brunneo in frustulas minutas endoperidio adnatas orbiculariter rupto; endoperidio fusco-succineo regulariter tenuiterque

foveolato; osculo coccineo, 4–5 dentibus instructo; mycelio stipitiformi, 12–25 millim. longo, e fibris cartilagineis, obscure melleis composito; sporis ovoideo-subglobosis, sub lente hyalinis, minute asperatis, 9–12 × 8–10 μ.

Hab. ad terram, Mont Mou, Novae-Caledoniae. Leg. Le Rat cui dicatus.

Mitremyceti Ravenelii et *M. Tyleri* proximus.

LYCOPERDON SUBVELATUM IN EUROPE.

Among the first authors to give figures of "puff balls" was Micheli, who wrote in 1783, and he was really the first to formulate any generic idea as to these plants. He gave a characteristic figure of a Lycoperdon (T. 97, fig. 3) which has heretofore never reached me from Europe, though I have what I take to be the same plant from Florida (Cfr. Myc. Notes, page 224), which we have called Lycoperdon subvelatum. We have just received for the first time from Europe, from Rev. Longinos Navas, Spain, a plant (Fig. 121 and Fig. 120 cortex enlarged) which corresponds to Micheli's figure and also to our Florida plant. Batsch seems to have been the first one to hunt up all the figures of Lycoperdons (of which he knew nothing) and give them names. He called this figure "Lycoperdon stellatum," but Linnæus had previously designated all the figures of various Geasters that he found as "Lycoperdon stellatum," and the name Lycoperdon stellatum never had any specific meaning.

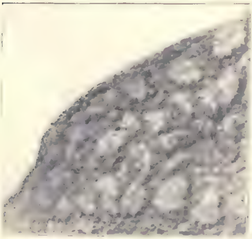

Fig. 120.

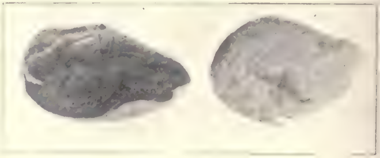

Fig. 121.

Lycoperdon subvelatum is characterized by the gleba turning quickly to purple, its subglobose form and the breaking up of its cortex into stellate fragments. It is very close to Lycoperdon velatum, only a reduced form I think. It is also close to Lycoperdon rimulatum of the United States (cfr. Myc. Notes, p. 223), a form that is not known from Europe.

Lycoperdon subvelatum is a plant apparently only of a southern range. In the United States it is only known from Florida, and in Europe, Micheli illustrated it from Italy, and it reaches me from Spain. Vaillant gave a figure (T. 16, f. 4) which seems to be the same plant, from the vicinity of Paris, but no modern mycologist has ever found any similar plant near Paris.

PUFF BALLS OF MAURITIUS.

We have received from C. A. O'Connor some fine specimens from Mauritius which are of particular interest, as the puff ball flora of this island is practically unknown. The first specimen is a Scleroderma (figs. 122 and 123), exactly as Scleroderma aurantium as to peridium and scales but opening in the manner of Scleroderma Geaster. The unopened plants can not be distinguished from Scleroderma aurantium, so common in Europe and the United States. But we think this species in these countries never opens in this manner. We shall call the plant Scleroderma patens and consider it a form of Scleroderma aurantium, notwithstanding that it belongs to a different section (Sterbeeckia) in Saccardo from that in which Scleroderma aurantium is placed. The plant differs entirely from Scleroderma Geaster in thinness and scaliness of its peridium.

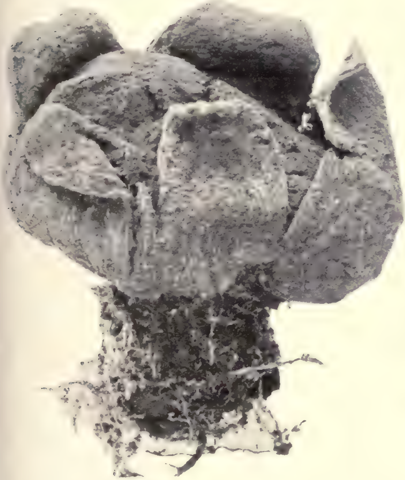

Fig. 122.

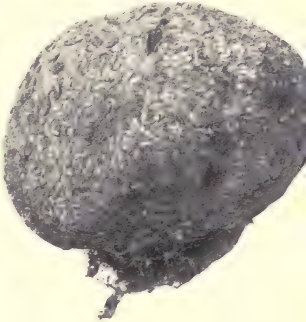

Fig. 123.

The second collection is Lycoperdon pusillum, typical of the plant of Europe.

Also two collections of bird-nest fungi of much interest to me as I am now at work on a monograph of the Nidulariaceæ.

The first collection is Cyathus Pœppigii, having the same cups and large spores that characterize this species. I think I have received the other species of Cyathus from other tropical correspondents, but as yet I am not sure as to its name.

BOUDIER'S PLATES.

The mycological world will be interested in the following letter from the publisher of Boudier's plates, the final sentence of which we take as a practical pledge that the *work will be completed*.

"PARIS, June 15, 1906."

"DEAR MR. LLOYD,—I am much obliged for your notes and kind endorsement of Boudier's plates, and hope they may influence additional subscribers to the work.

"Will you allow me to make a little correction as to your statement of an 'advance of price?' You reproach me as having made a third advance in price. This is a mistake. The price of Boudier's plates has never been changed from the announcement that was made in the first circular issued, viz., the price of each series when completed is 200 francs, and a reduction is offered of ten per cent to those who subscribe before the completion of each series. Thus the price now is 200 francs for the first (completed) series, and 180 francs for each of the five (as yet unissued) series. It is true that a special price was made in favor of those who, having confidence in the author and in myself, subscribed before any portion of the work was issued. Of the eighty-eight subscribers, seventy showed their confidence by subscribing before a single part was distributed. When I became convinced that among at least three hundred serious mycologists there are not two hundred and fifty who would support a work like that of Boudier, I reduced the issue to one hundred and twenty-five copies, thus increasing the relative cost to me nearly double. Notwithstanding, I did not modify the terms from those I had announced at the start, although it would have been entirely legitimate.

Boudier's plates are, as you state correctly, not a commercial matter purely. They shall be models for future illustrations of fungi, and *must be produced and finished as a sample of good work*." (Italics ours.)

"Yours most faithfully,
"PAUL KLINCKSIECK."

We are so highly pleased with the announcement above that "Boudier's plates must be produced and finished" that we are not disposed to argue about the terms. We are not among those (fortunate seventy) who had enough confidence in Mr. Klincksieck to subscribe in advance, but we have no grievance in that regard. We consider ourselves fortunate in being able to own the work at any price, and if we mistake not in a few years there will be many libraries and individuals who will want the work and can not obtain it at *any price*. Only one hundred and twenty-five copies are printed. At least ten of these go to Mr. Boudier's family and to the state, and the publisher will retain one, etc., so that only one hundred and fifteen will ever be sold. We learn from Mr. Klincksieck's letter that eighty-eight have been subscribed, which is nine additional since our last writing, so that only twenty-seven copies are left. It will not be long, we think, until these twenty-seven are spoken for.

We can not add anything to what we have said of Boudier's work. They are, in our opinion, the *only perfect plates of fungi* ever issued. From an artist now engaged in preparing a series of illustrations of American agarics (which we hope will some day be published) we have the following letter:

"Your appreciation of Boudier's plates is of particular interest to me, as I have seen these in the library at ———. Without a doubt, no remarks could be appreciative enough of such work. In this age of get-into-print-quick-science, it is gratifying to see that there are still some left who follow the example of the old masters in their great ability to take pains."

We do not give his name, for the work on which he is engaged is a partial secret, but he is an artist and a mycologist, competent to judge of good work.

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 23.

CINCINNATI, O. AUGUST, 1906.

THE GENUS BOVISTELLA.

Peridium flaccid, with or without a sterile base, opening by a definite mouth. Capillitium of short, separate threads or long, intertwined threads. Spores pedicellate.

We would extend the limits of the genus Bovistella as above, for the following reasons. When Prof. Morgan proposed the genus he knew but one species and he clearly defined it as having a sterile base and short, separate capillitium threads. If we had but this one species it would be easy to define our genus, but there are many related plants in the world; some agreeing in both these characters, some having only one of them and others neither. The genus Bovistella shades by a continuous series of species into Lycoperdon on one hand and Bovista on the other.

In order to get a clear view of the group of plants that we would include in the genus Bovistella, we must go back a little in our classification. The largest tribe of puff balls, the Lycoperdeæ, consists of unstalked plants having the gleba composed of spores and capillitium. Without considering the Geastræ alliance (with which we are not now concerned) the remainder of the plants can be divided into two series of genera according to their habits and spore dispersion.

First, the Bovistæ, or the "tumblers" of the puff ball world, which when ripe break away from their place of growth and are tumbled about by the wind, dispersing their spores gradually as they roll about. These plants have a form (usually globose) and a peridium (firm, cartilaginous or hard) suitable for this method of spore dispersion. They do not have sterile bases but plants intended to roll naturally would not develop sterile bases which would only interfere with their rolling. Bovista, Mycenastrum and Catastoma are familiar representatives of these plants.

Second, the Lycoperdæ or true Puff Balls, which are just the reverse of the previous tribe, do not normally break away from their place of growth when ripe, but disperse their spores by the collapsing of the peridium, which hence has a nature usually much more flaccid than the previous tribe. As to the sterile base, it is only a means of raising the fertile portion above the surrounding growths. Species that usually grow in grass or moss, normally develop strong sterile bases, and species

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AT LOS ANGELES

usually found on bare ground having no need to raise up the fertile portion, either develop a sterile base very slightly or not at all. The sterile base has no value in classification, generically or even specifically.[†]

The genus Bovistella belongs to the tribe of Lycoperdæ and is distinguished from all the Bovistæ, not by the presence or absence of a sterile base, but by its method of spore dispersion. Hence, little globose species that do not have a sterile base but have subflaccid peridia and a strong rooting system that holds them to their place of growth when ripe, we do not call Bovista, but Bovistella.

In examining the gleba of the Lycoperdæ under the microscope two very strong characters are found. First we find certain species that have short, separate, capillitium threads (fig. 12~~5~~).4 Second, we find certain species that have permanent pedicels to the spores[‡] (fig. 12~~4~~)5

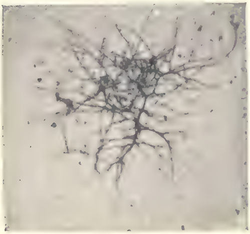

Fig. 124.

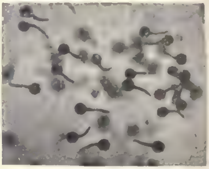

Fig. 125.

Frequently these two characters are associated in the same plant, but not always, and we believe it will simplify classification to embrace in the genus Bovistella all plants of the tribe Lycoperdæ that have *either* or *both* of these characters.[§] Taking the genus Bovistella in this broad sense we can readily divide it into a number of sections, which will no doubt in time be raised to generic rank by those who delight in multiplying the genera.

[†] The only idea in connection with Quélet's genus Globaria apparently is "puff balls that are round." As now classified it embraces in his Enchiridion three species of Bovista, one Catastoma, one Calvatia, one Lycoperdon, one Bovistella and two species, genus unknown to me. It illustrates the value of a genus based on the absence of a sterile base.

[‡] Statement has been made that pedicellate spores in the Lycoperdæ are not of permanent value and that all spores lose the pedicels with age. I think that this is incorrect and that there is no better character among these plants than the character of permanent, pedicellate spores. It is true that all Lycoperdons perhaps have the spores pedicellate when young; in some these pedicels are absorbed in deliquescence, in others remain, but are *separate* from the spores in the ripe gleba. In these the articulation is at the *top* of the pedicel. Truly pedicellate spores have the articulation at the *base* of the pedicel which remains *permanently attached* to the spores. We have examined specimens of this type of spores in Ray's herbarium, collected two hundred years ago, and have found *every pedicel attached*.

[§] All Bovistellas to our knowledge have pedicellate spores, but we would not exclude from the genus a species having short, separate, capillitium threads and spores not pedicellate, if we knew such a plant. In the genus Bovista there is such a species, Bovista pila.

SECTION 1.—BOVISTELLA TRUE.—Capillitium short, separate threads. Spores pedicellate. Sterile base well developed.

SECTION 2.—BOVISTELLA LYCOPERDON.—Capillitium long, intertwined threads. Spores pedicellate. Sterile base well developed.

SECTION 3.—BOVISTELLA BOVISTA.—Capillitium short, separate threads. Spores pedicellate. Sterile base scanty or none.

SECTION 4.—BOVISTELLA-GLOBARIA.—Capillitium long, intertwined threads. Spores pedicellate. Sterile base scanty or none.

The Species of Bovistella.

Section 1.—Bovistella True.

Capillitium short, separate threads. Spores pedicellate. Sterile base well developed.

BOVISTELLA OHIENSIS (Plate 86).—Peridium usually globose or depressed-globose, with a strong tap root; dehiscing by a large but definite opening. Cortex of soft, well developed, cruciate spines somewhat detersive in its nature. In old specimens it falls away, leaving the peridium smooth. Sterile base of large cells, usually occupying about half the interior. Gleba olive or brown, never purple. Capillitium of short, separate, much branched threads. Spores smooth, subglobose or slightly oval in shape, 4-5 mic., with slender permanent pedicels, 10-12 mic. long.

This is a very common species in the United States and of a southern range. It occurs from Washington, D. C., west to Missouri and all over the Southern States. It is not found in the extreme east, north or west. At Cincinnati it is the most frequent puff ball that we have. It takes very kindly to cultivated ground and I gathered it abundantly one season in Professor Morgan's garden.

SYNONYMS.—It was always a mystery why Schweinitz never found this plant, but it is not to be found in his herbarium. Considerable correspondence passed between Ellis and Morgan before the plant was named, and at one time it was proposed to call it Lycoperdon velutinum.[†] Finally Cooke wrote Ellis that it had the capillitium of a Mycenastrum[‡] and Ellis published it (Jour. of Myc. 85-89) as "Mycenastrum Ohiense, Ellis and Morgan." De Toni has compiled it as Scleroderma Ohiense.[§] When Morgan wrote his work he based on it a new genus, calling the plant Bovistella Ohiensis, and the genus Bovistella based on the best of structural characters will always stand. No one has yet attempted to juggle the generic name.

FORMS.—We have received from Dr. Glatfelter, Missouri, a form with notably larger spores (6-7 mic.) but we hardly feel it worthy a name. Also in Ellis' herbarium is to be found an unusually robust specimen (See Plate 86, fig. 7) collected by Gentry in Indiana. It rarely occurs so large.

SPECIMENS IN OUR COLLECTION.

Alabama, A. S. Bertolet; *Florida,* C. E. Pleas; *Indiana,* R. V. Converse; *Iowa,* J. F. Clarke; *Kentucky,* John Nelson; *Louisiana,* Rev. A. B.

[†] Specimens bearing this name are still to be found in Ellis' collection, and in Cooke's herbarium I found a specimen sent by Ellis which Cooke has labeled "Mycenastrum (Sterbeeckia) velutinum, Ell. and Morg."

[‡] Cooke's ideas of Mycenastrum capillitium were evidently very vague at that time.

[§] Which is a fair sample of considerable of the compilation made by De Toni in Vol. 7 of accardo. It has *not one single character* of the genus Scleroderma.

Langlois; *Maryland,* Charles McIlvaine; *Mississippi,* A. C. Wharton; *Missouri,* C. E. Brown, B. M. Duggar, N. M. Glatfelter (4 collections); *North Carolina,* W. L. Poteat, Fred K. Vreeland; *Ohio,* M. G. Bohn, C. G. Lloyd (5 collections); H. L. True; *South Carolina,* P. H. Rolfs (2 collections); *Tennessee,* H. M. Caldwell, Mrs. M. S. Percival; *Texas,* E. P. Ely, T. C. Horton (2 collections), W. H. Long, J. W. Stiles; *Washington, D. C.,* F. J. Braendle (2 collections).

BOVISTELLA RADICATA (Plate 87).—The European form of this plant is hardly worthy of a separate name. It is a more rigid plant, and has stiffer cortex spines and not so strong pedicels to the spores which is all the difference I can note. Originally collected in Algeria by Durieu, it was called Lycoperdon radicatum by Montagne. Recently it has been collected in Tunis by Patouillard, and the name changed to Bovistella radicata. In Europe it is a *very rare plant* and only two collections are known, both made during the past season (1905) and sent to me. First, by Rev. P. Merino, Galicia, Spain; second by Prof. Plöttner, Rathenow, Germany.

SPECIMENS IN OUR COLLECTION.

Tunis, N. Patouillard.
Spain, Rev. P. Merino.
Germany, Prof. Plöttner.

A FORM FROM JAPAN.—We have received from K. Miyabe a specimen collected at Sapporo by J. Hanzawa, which is we think a form of Bovistella Ohiensis. The specimen is old and little more than a sterile base and hence we are not sure as to its cortex. It has the appearance, however, of being an old specimen of Bovistella Ohiensis, the same structure and threads. The spores are slightly different from the American plant, being perfectly globose, slightly larger, 5-6 mic, and with pedicels so *thin* they are seen with difficulty.

BOVISTELLA LYCOPERDOIDES (Plate 87).—Peridium subglobose with a stem-like sterile base. Cortex white, of small, tufted, soft spines. Gleba *dark umber.* Capillitium short, separate threads. Spores smooth, 5-6 mic., with slender pedicels. This plant is related closely to the preceding but differs in shape, cortex, habitat and gleba color. Only one collection is known, made at Nilvala, N. W. India, by O. W. Duthrie, and preserved at Kew. These specimens grew in moss. The plant was called by Cooke Mycenastrum lycoperdoides and is compiled in Saccardo as Scleroderma lycoperdoides.

BOVISTELLA PALUDOSA (Plate 87).—Peridium *reddish* brown, subglobose, contracted to a short stem-like base, thin, becoming smooth when old. Cortex minute, sub-furfuraceous. Sterile base scanty.† Gleba dark olive. Capillitium of separate, branched threads, with the main stem thick, 8-10 mic., and deeply colored. Spores globose, smooth, 4-5 mic., with slender pedicels, 10-12 mic. long.

This plant grows in Sphagnum moss and is quite similar to the preceding. It has a different cortex and color. But one collection is known, made by Léveillé at Malesherbes, France, in 1845. Two specimens of this collection are in the Museum of Paris and one at Kew. It was called by Léveillé Bovista paludosa and compiled in Saccardo as Calvatia paludosa. It has no relation whatever to the genus Calvatia.

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† I can not be sure it has a sterile base as specimens are not cut open. However, all plants with this *shape* I have ever seen do have sterile bases.

All the previous plants have thin peridia of the same nature both as to peridia and cortex as the genus Lycoperdon. The two following are quite different in having much more rigid and almost smooth peridia.

BOVISTELLA AMMOPHILA (Plate 87).—Peridium thin, rigid, brittle, smooth, with a long tap root. Sterile base of large cells, firm, rigid, occupying about one-third the interior. Gleba dark brown. Capillitium of separate, short, branched, deeply colored threads. Spores oval, smooth, 4-5 mic., with slender, tapering pedicels.

But one fragmentary specimen of this plant is known, (See Plate 87, fig. 7) collected in the sand near Bordeaux, France, by Léveillé, and preserved in the museum at Paris. Not much remains of the specimens but the sterile base, which is more firm and rigid than I have ever seen in any other puff ball. The cortex of the plant appears to be smooth.

BOVISTELLA JAPONICA (Plate 88).—Peridium firm, rigid, with a strong, rooting base. Cortex of minute, nodular, fasciculate spines resembling in surface that of undressed leather (Fig. 125 enlarged). Sterile base of large cells (soft not rigid as in previous species), occupying about half of the interior of the peridium. Gleba light olive. Capillitium separate, much branched, light colored threads. Spores globose, 4-5 mic., smooth with slender pedicels.

This plant is closely allied to the previous, differing in spores, size, cortex and in not having a *rigid* sterile base. Specimen collected at Sapporo, Japan, by Kingo Miyabe.

Fig. 126

SPECIMENS IN OUR COLLECTION.

Japan, Kingo Miyabe.

Section 2.—Bovistella-Lycoperdon.

Capillitium long, intertwined threads. Spores pedicellate. Sterile base well-developed. Plants of this section can be called either Bovistella or Lycoperdon, and we would have no quarrel with any one who may adopt either of these views. We are quite willing to concede that the capillitium character of a Lycoperdon is a stronger character than the spore character of a Bovistella. At the same time the genus Lycoperdon is a large and unwieldy genus, and we feel it simplifies matters much to take out from it a natural section and place it in another genus with which the section agrees in a prominent character and in which it disagrees from the remainder of the genus Lycoperdon.

BOVISTELLA AUSTRALIANA (Plates 33 and 70).—Plant with a well developed base of large cells. Cortex minute, nodular, furfuraceous. Peridium becoming smooth when old. Gleba olive umber. Capillitium long, branched threads with pointed branches. Spores globose, smooth, 4 mic. with slender pedicels, 12-15 mic.

This is a small species with a strong tap root. The shape varies from subglobose to somewhat elongated as shown in our plate. There is a corresponding variance in the development of the sterile base. It appears to be the most frequent species of Bovistella in Australia.

SPECIMENS IN OUR COLLECTION.

Grantville, Australia, J. T. Paul.
Andover, New Zealand, Robert Brown.

BOVISTELLA SCABRA (Plate 70).—Plant with a well developed sterile base of large cells. Cortex of well developed short, scabrous, connivent spines. Gleba olive umber. Capillitium of the Lycoperdon type of long, branched, intertwined, attached threads. Spores globose, 4-5 mic., smooth, with slender pedicels. This plant is known only from Australia. It has the general size, appearance and structure of Bovistella australiana, and differs only in the cortex.

SPECIMENS IN OUR COLLECTION.

Australia, J. G. O. Tepper, F. M. Reader, J. T. Paul.

BOVISTELLA GLABESCENS.—Plant with a well developed sterile base of small cells. Smooth now, but probably had a prominent cortex. Gleba olive umber. Capillitium long, intertwined threads. Spores globose, 5 mic., smooth, with slender pedicels.

There is one collection at Kew from Tasmania. We have not received the plant from any of our correspondents.

The previous species of this section have relatively short spore pedicels, 10-12 mic. long, the usual length of Bovistella pedicels. The three following species have pedicels excessively long, 16-24 mic. and are easily known from this character.

BOVISTELLA MIYABEI (Plate 88).—Peridium oval-globose. Cortex of short spines somewhat gemmate in its nature, falling away and leaving the denuded surface reticulate, pitted. Sterile base of large cells, occupying about one third the interior. Gleba olive. Capillitium deeply colored, long, intertwined threads. Spores globose, smooth, 4 mic. with very long, hyaline pedicels (20 mic.).

This species is very close to Bovistella pedicellata, but differs in its cortex and pitted surface of the peridium. We received the specimen from Mr. K. Miyabe, Japan, for whom we have the pleasure of naming it.

SPECIMENS IN OUR COLLECTION.

Japan, K. Miyabe.

BOVISTELLA PEDICELLATA (Plate 88).—Peridium globose or piriform. Cortex of long, rather stiff spines, resembling in nature the cortex of Lycoperdon echinatum, but not so long. Falling away and leaving the peridium smooth. Gleba olive or brown. Sterile base of large cells, filling one quarter to one third of the interior, sometimes almost absent. Capillitium deeply colored, long, intertwined threads. Spores globose or slightly oval, smooth, 4-5 mic. with very long, hyaline pedicels (20-24 mic.).

This species is rather a rare plant in the United States and of a northern range only. It is much more common in Canada. In Europe it is also a rare plant and of a northern range. The plant was named by Prof. Peck Lycoperdon pedicellatum about 1875, and a year or so afterwards, in Europe, by Schroeter as Lycoperdon caudatum.

SPECIMENS IN OUR COLLECTION.

Canada, John Dearness, Rev. P. Lemay, J. Macoun, Miss I. M. Walker; *Illinois*, Dr. L. H. Watson (2 collections); *Michigan*, A. L. Voight, L. E. Weld; *Minnesota*, Minn. Bot. Survey; *New York*, Chas. Peck; *Nova Scotia*, E. D. Lordley; *Ohio*, A. P. Morgan (2 collections); *Pennsylvania*, Dr. Herbst (2 collections); *West Virginia*, C. G. Lloyd (2 collections); *Wisconsin*, R. H. Denniston (3 collections).

Sweden, L. Romell.
Germany, Dr. Magnus, Prof. Plöttner.

FORM.—BOVISTELLA GEMMATUM (Fig. 126).—We have from R. H. Denniston, Madison, Wis., a form with reduced, scabrous cortex (fig. 126 enlarged), agreeing with the normal form in all other particulars. It may be only a sport.

SPECIMENS IN OUR COLLECTION.

Wisconsin, R. H. Denniston.

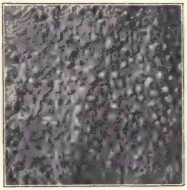

Fig. 127.

BOVISTELLA DOMINICENSIS (Fig. 127).—Peridium globose, contracted to a short stem-like base. Cortex short, furfuraceous (?),† falling away and leaving the surface smooth. Gleba olive. Capillitium long, intertwined, colored threads. Spores globose, 4-5 mic., *minutely spinulose*, with long pedicels (16-20 mic.). (Fig. 127, type at Kew.)

These specimens I found in the herbarium at Kew, labeled Lycoperdon Dominicensis, in the handwriting of Prof. Massee. I think it was never published. The specimens were collected by the "West Indies' Exploration Committee," on the island of Dominica. It is very close to the preceding species but differs in having rough spores. These are *very minutely* echinulate, however, and appear smooth except under a strong objective.

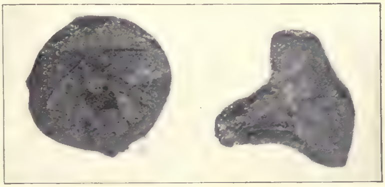

Fig. 128

Section 3.—Bovistella-Bovista.

Capillitium short, separate, branched threads. Spores pedicellate. Sterile base none.

This section is very close to the genus Bovista from which it differs in habits.

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† We can not be sure but that the plants have had stronger cortex spines that have fallen away. There is a sketch with the plant showing such spines, but we think it is not authentic.

The plants have a strong rooting system that binds them firmly to the soil and they do not become "tumblers." At the same time the interior structure is that of a Bovista and the only objection to so calling them is, if included in the genus Bovista it is not possible to clearly define the latter genus.

BOVISTELLA DEALBATA (Plate 88).—Peridium globose, thin, opening by a definite mouth, strongly attached to the soil, and not breaking away (normally) when mature. Cortex a thin, furfuraceous coat, which first breaks into areas, and then disappears leaving the surface smooth. Sterile base none. Gleba olive brown. Capillitium of separate, deeply colored, branching threads. Spores globose, smooth, 4-5 mic.,† with slender pedicels, 10-12 mic.

This plant is only known to occur on the Pacific coast. It has a general close resemblance to Bovista plumbea but different habits and a different cortex. It was compiled in Saccardo as Bovista dealbata, but I do not believe the compiler has any clear ideas as to the distinction between Bovista and Bovistella.

SPECIMENS IN OUR COLLECTION.

Washington, W. N. Suksdorf; *California*, S. B. Parish.

BOVISTELLA BOVISTOIDES (Plate 70).—Peridium flaccid, dark brown, globose, thin, opening by a definite mouth, attached to the soil and not breaking away when mature. Cortex a thin, furfuraceous coat which breaks into areas and is subpersistent. Sterile base none. Gleba dark, brown. Capillitium of separate, deeply colored, branching threads. Spores globose, smooth, 4-5 mic. with slender pedicels, 10-12 mic.

Originally described from India ‡ I have received it from correspondents both from British India and Australia. It is very close to the preceding species, and the descriptions read very much the same. On comparison, however, they are quite different. This species has much thinner, more flaccid peridium, darker in color and a different colored gleba.

SPECIMENS IN OUR COLLECTION.

British India, G. H. Cave.
Australia, J. G. O. Tepper, Prof. D. McAlpine (3 collections), F. M. Reader.

BOVISTELLA HENNINGSII (Plate 89).—Plant subglobose, devoid of a sterile base. Peridium papyraceous-cartilaginous. Cortex minute, *fasciculate*, persistent spines. Gleba olive-lead color. Capillitium separate, deeply colored, thicker walled threads with thick (12-16 mic.) stem and relatively short, strongly tapering, pointed branches. Spores globose, smooth, 4-5 mic. with thin pedicels.

All that I know of this species is a plant from Mussooree, British India, which I found at Berlin, labeled "Bovista plumbea, form," and half of which was given to me by Dr. Hennings. I feel sure it should not be referred to Bovista plumbea, as it has a cortex different from all known Bovistas, but I am not so sure it should be referred to Bovistella, as one can not judge of the habits of a plant from a single specimen. In its peridium and internal structure it is a Bovista, indeed the spores and capillitium are almost the same as Bovista plumbea. I am influenced in referring it to Bovistella, at least until more is known of the plant, by the cortex as I know of no species of Bovista with such a cortex. From its peridium nature, however, I suspect it is a "tumbler," in which case I would transfer it to Bovista, notwithstanding its cortex.

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† When the plant was described the measurement was given as 4 mic., but I see them larger now.

‡ As Mycenastrum bovistoides and compiled in Saccardo as Scleroderma sic bovistoides.

BOVISTELLA YUNNANENSIS (Bovista yunnanensis, Rev. Myc. 90, 134) belongs I think in this section. Peridium globose, rather firm, without sterile base. Cortex almost smooth. Capillitium of *separate* threads but not *short*. Long, intertwined, with tapering branches. It is not possible to float out separate threads, but I think they are of this type. Spores globose, smooth, 4 mic. with slender, thin pedicels. It was described from China.

Section 4.—Bovistella-Globaria.

Capillitium of long, intertwined threads. Spores pedicellate. Sterile base scanty or none. We call this section Bovistella-Globaria, for want of a better name. It agrees with the characters attributed by Quélet to his "genus" Globaria, though not a single species included by Quélet in the genus belongs in this section.† Plants of this section have usually been called Bovistas, but having neither the habits, capillitium or peridium of this genus of the present day, they can not be so classified excepting under the old definition, viz.: "Bovista—a puff ball without a sterile base." With the present knowledge of the various characters of such plants, the definition is about as crude as the Linnæan idea that all fungi full of dry spores are Lycoperdons.

BOVISTELLA GUNNII (Plate 70).—Plant globose, 3-4 cm. in diameter, devoid of a sterile base. Peridium flaccid, opening by a definite mouth. Cortex a flocculent, woven coat, which when old dries up and breaks into areas which persist on the dark reddish brown peridium. Gleba olive when young, becoming dark brown when old. Capillitium of long, intertwined, branching threads. Spores globose, 5-6 mic., smooth, with slender pedicels.

This species is known only from Australia. Externally it has the general appearance of being a large specimen of Bovistella bovistoides but the capillitium is not of the same type.

SPECIMENS IN OUR COLLECTION.

Australia, Prof. D. McAlpine, F. M. Reader.

BOVISTELLA ASPERA (Plate 33).—Peridium subflaccid, subglobose, with a strong tap root. Cortex of thick, well developed spines, converging in fours, when old largely falling away, leaving the peridium smooth, furfuraceous. Sterile base none or very slightly developed. Gleba olive or brown (Cfr. Myc. Notes, p. 247). Capillitium long, branching, intertwined threads. Spores globose, smooth, 4-5 mic. with thin pedicels, 8-10 mic.

Originally described from Chile, it has been discovered in Australia (Cfr. Australian Lycop., p. 28) and New Guinea. The latter plant was

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†And we might add that three of his species do not have "Spora spiculo longo suffulta" as required in his generic characters.

described as Globaria Lauterbachii (Bovista Lauterbachii), but I have compared the type specimen with the type of Bovistella aspera at Paris, and find them to be the same. Lycoperdon citrium, Ceylon, is a similar plant. Lycoperdon hongkongense, China, of which no type exists, is described as having elliptical spores, but otherwise it is evidently very close.

SPECIMENS IN OUR COLLECTION.

Australia, W. W. Watts.

BOVISTELLA ECHINELLA (Plate 89).—Peridium *very* small, dark, reddish brown, globose, opening by a definite mouth. Cortex minute tufted spines, arranged in subdistant patches over the peridium. When old drying down, usually persistent (rarely falling away). Sterile base none. Gleba olive brown. Capillitium of long, branched, intertwined threads, attached to the peridium in young specimens, but separating in old, and becoming curled and matted. Spores globose, smooth, 4-5 mic. with pedicels 10 mic.

This unique little species enjoys the distinction of being the smallest "puff ball" known. Rarely is it more than a half cm. in diameter. Originally described from Ecuador as Bovista echinella, it is of wide distribution and has reached me from six collectors and from five different countries. All the collections that I have are from widely separated localities, and it is everywhere a rare plant. It usually grows on semi-naked ground in collection with a little moss.†

I notice a slight variation in the spores, varying from 4 to 6 mic. and the pedicels from 6 to 12 mic., in specimens from widely different localities, but I do not feel that this variation is more than could be expected.

SPECIMENS IN OUR COLLECTION.

Ecuador, type from herb, Patouillard.
Jamaica, W. Jekyll.
Mexico, J. N. Rose.
Michigan, B. O. Longyear; *Washington*, W. N. Suksdorf.
Europe, Denmark, Rev. A. Breitung.

The preceding species of this section have smooth spores. The two following have spores that are not smooth.

BOVISTELLA DAVISII (Plate 89).—Peridium subglobose, flaccid. Cortex very minute, fasciculate spines (like the usual piriform cortex). Sterile base none. Gleba olive. Capillitium of pale colored, long, branched threads. Spores globose, *minutely rough*, 4-5 mic. with slender pedicels 10-14 mic.

This is a very rare species and has reached me but twice, both from Massachusetts. I name it for Simon Davis, of Boston, who has collected for many years very abundantly for our museum.

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† Funaria hygrometrica. Thanks to Monsieur F. Camus for the name.

Specimens in our Collection.

Massachusetts, Falmouth, Simon Davis; *Bedford,* Chas. W. Jenks.

BOVISTELLA TRACHYSPORA (Plate 89).—Peridium *dark, reddish brown,* globose, small, ½-1 cm., thin. Cortex minute, tufted spines scattered in nodules over the surface and mostly falling away, leaving the peridium smooth. Sterile base none. Gleba dark brown. Capillitium of long, branched, intertwined threads, much curled and matted. Spores globose, 5 mic., *tuberculate,* with slender pedicels, 10-12 mic.

This unique little species reaches me from British India. It evidently grew in the moss. It has the general appearance of Bovistella echinella from which it differs (as indeed from all other known Bovistellas) in having markedly *rough spores.*

Specimens in our Collection.

British India, "Respana Valley, Mussooree, N. W. Himalaya," Wm. Gollan.

TWO RARE PLANTS FROM AUSTRALIA.

Mr. Walter Gill is the Conservator of Forests of Australia. His official duties call him to travel considerably and he has the very commendable habit of picking up and sending to me such "puff balls" as he notes in his travels. He has found several interesting things, but none of so much interest to me as his last package, for it includes two very rare species, Battarrea phalloides and Geaster Smithii.

GEASTER SMITHII (Fig. 128).—This species was discovered in Florida, and as we have never seen other than the original collection we were beginning to doubt the species. As a general rule we are somewhat suspicious of species based on a single collection. Mr. Gill's plants have the same peculiar characters on which the species was based and tend to confirm the validity of the species. Geaster Smithii (Geastræ, p. 21) is an intermediate plant between Geaster Archeri and Geaster pectinatus. It is related to the former in its subsessile endoperidium and to the latter in color (black) and sulcate mouth. It differs from both in the nature of the mouth, which instead of being beaked and protruding is flattened and seated on a depressed area. The discovery of this plant in Australia, heretofore only known from a single station in Florida, has brought us more satisfaction than if Mr. Gill had sent us a dozen "new species."[1]

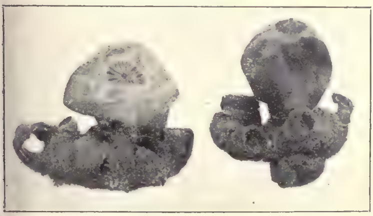

Fig. 129.

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[1] When Geaster Smithii was named, it was under the impression that it was the same plant as had been illustrated from England under the name Geaster striatus. We feel quite certain now that this is an error, as no such plant grows in England, but the name will have to stand as published.

BATTARREA PHALLOIDES (Plate 28).—This plant has been considered in full in our recent Tylostoma pamphlet. In western Europe the genus is very rare, being known from a few stations in England and only one in France. In Australia the genus is more common, and we have on two occasions received remnant specimens. However, Mr. Gill's are the first good specimens we have received from Australia. He found these at Tunby Bay, on the west coast of Spencer's Gulf, South Australia. They grew in the sand hills near the coast under "shed-oak" trees. Mr. Gill states they were fairly abundant but he has never seen them elsewhere. The volva was deeply buried in the sand. The occurrence of Battarrea phalloides "fairly abundant" at any station is a matter of great interest, for while the genus Battarrea is widespread, the individuals are usually rare.

LYCOPERDON SUBPRATENSE.

We have received from W. N. Suksdorf some young specimens which are the first we have seen with a cortex. This is exactly the same as in the European plant, Lycoperdon pratense, and as the American plant only differs from the European in having colored capillitium we doubt if it should have a distinctive name even as a form. Of much more interest to us, however, than the name, is the distribution of the plant. It is curious that this species, one of the very common species of Europe and Australia, should occur in our country only at a few stations on the Atlantic coast and again at a few stations on the Pacific coast, and is apparently absent from all the vast extent of intermediate territory. The English mycologists are just beginning to find out that it grows in England and an article recording it as new to the flora (under the alias Lycoperdon depressum) recently appeared in one of their journals. It is undoubtedly a frequent plant in England. I have received it from three English collections and it can be found at the British Museum (misnamed) collected by an English botanist (unknown), evidently long ago. Our figure (129) made from Mr. Suksdorf's specimens will show the nature of the cortex and the section shows the sharp line of demarkation between the gleba and sterile portion, which is the strong character of Lycoperdon pratense.

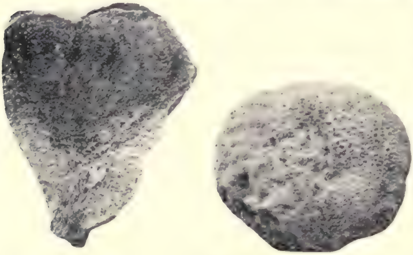

Fig. 130.

NOTES OF TRAVEL—GENEVA.

There are few cities in the world that can boast of as many important botanical institutions as are to be found at Geneva. It is an ideal location, with a fine climate both summer and winter, and freedom from all dust and smoke, the great drawback to institutions located in large cities.

THE CANDOLLE LIBRARY AND HERBARIUM.

This has the reputation, and I think justly, of being the largest, best-selected, and most complete private botanical library in existence. It has been built up gradually for a hundred years, all important botanical books being purchased as issued. It has been handed down now from father to son for four generations, of which two are now living. It is not necessary to tell botanical readers of the work that has been done in phænogamic botany by the Candolles. No name is better known in the botanical world, and the writings under this head require as much or more space to enumerate in Pritzel as any other one name, not excepting Linnæus. The Candolles are a Swiss family. (I have always thought they were French, probably because their writings are in French). The family home has always been Geneva.

The original Candolle, who first became interested in botany, Auguste-Pyrame de Candolle, began the monumental work Prodromus Syst. Nat. Regni Veget., in which all then known species of phænogamic plants of the world are classified. It was continued and completed by his son, Alphonse de Candolle, and required for its production nearly fifty years of continuous work.

The botanist of the third generation, M. Casimer de Candolle, is now seventy years old, but a vigorous, active man, whose appearance belies his age, and I should not have taken him to be over sixty. His son, M. Augustin de Candolle, is a young man. He was educated, I am told, for the law, but never practiced the profession, devoting now his time and study to botany in order to continue in the line of his illustrious family.

The Candolle herbarium is as rich as the library, and is the accumulation of more than a hundred years. The original herbarium on which the Prodromus was based is kept separate and intact, and is known as the Prodromus herbarium. Probably no other in existence is of as much historic value or contains as many types. The Candolle library and herbarium are in a private residence in Geneva, and my impression is that it is the same house in which it was begun. It is not a fireproof building, but erected in the substantial manner of most buildings in the cities of Europe, where fires, fortunately, rarely occur.

THE BOTANICAL GARDEN AT GENEVA.

This institution is maintained by the city of Geneva. It is located on the lake front, some distance from the city proper. The herbarium is extensive, and is chiefly made up of the herbarium of Delessert. In the puff ball line I found in the herbarium of Delessert some fine specimens collected by Gaudichaud, Drège, and Zollinger, and several of them, although they were not named, are co-types and better specimens than the type. The mycological collection of Fayod is also in the herbarium, and it includes a large number of really good colored drawings of agarics which would be of great aid to any one making a study of the Swiss agarics. The herbarium building of the garden is constructed of wood, and I could not but think it would make a fine blaze if a good fire ever gets a start.

Monsieur J. Briquet, who is well known for his work on the flora of the Alps, is the director of the gardens; Monsieur G. Hochreutiner, the assistant director. To both of these gentlemen I am indebted for every attention and courtesy.

L'HERBIER BOISSIER.

This institution is located at Chambésy, a suburb of Geneva. It is beautifully situated on the lake front. Edmond Boissier was an enthusiastic collector and student of plants. Possessed of a large fortune, he was enabled to indulge his taste for travel, and the Flora Orientalis is largely based on his collections in the Orient. He established, also, a private botanical garden at Valleyres, and an extensive arboretum near Geneva. The latter has a world-wide reputation as perhaps the largest and best collection of coniferous trees ever brought together. At his death, about twenty years ago, the property came into the hands of his son-in-law, William Barbey, who has not only maintained and added to it, but has erected a fine, artistic building for the herbarium and library. I have seen many herbariums, but I never saw elsewhere plants mounted with as much care and expense as in the Herbarium Boissier. Each species has specially printed cover, and each specimen is mounted on a printed sheet. The puff balls of the collection are mostly from purchased sets, largely misnamed and wrongly classified as such exsiccatæ specimens always are. In addition, however, the collection includes the herbarium of Fuckel and of "Mueller Arg." In Fuckel's herbarium I found twelve authentic specimens of Bonorden's collections of which eight are "types." As far as I know these are all the specimens that exist determined by Bonorden.

Monsieur Gustave Beauverd is the curator of the herbarium. He is well known as the editor of the Bulletin de l'Herbier Boissier, and also the card index issued in this institution.

HISTORIC PUFF BALLS AT GENEVA.

My visit to Geneva was to find, if possible, the type specimens of Lycoperdon Corium which was published in De Candolle's Flora France. When Desvaux proposed the genus Mycenastrum he referred the species to Lycoperdon Corium, and while Mycenastrum Corium is well authenticated and well established, and it will never be practicable to change the name, if such a fool proposition were possible, I have always suspected it was originally based on a misdetermination.

The type specimen does not exist, as the only specimen in the Herbarium Candolle which is labeled "Lycoperdon Corium" was collected (1813) five years after the publication of the species. *It is Scleroderma Geaster*, and the original "description," if clearly studied, will be found to apply to Scleroderma Geaster much better than it does to Mycenastrum Corium, and all Sclerodermas were in those days known as Lycoperdons.†

I was interested in finding in the Herbarium Candolle the type specimens of "Cyathus fimetarius, D. C.," as, although it is usually carried in European works, it has become known as a "lost species." I had thought it might possibly be Cyathus stercoreus, which grows on manure, and has been found a few times in Europe. *Cyathus fimetarius is Crucibulum vulgare growing on manure.* This common species usually grows on chips, rubbish, etc., and ought to confine itself there, because every time it comes on manure, although otherwise it preserves the same characters to the most minute detail, it loses its generic character for the new species makers, and has twice been described as a new species of "Cyathus."

In the Herbarium Delessert at Geneva are a number of nice specimens of rare plants collected by Gaudichaud, Drège, and Zollinger, which were mostly named at Paris. The Geneva specimens were all unnamed or misnamed, but they are in reality "co-types," and mostly better specimens than the "types." Tylostoma Leveilleanum (better specimens than the types), Catastoma Zeyheri (the only other known is at Kew), and Tylostoma Berteroanum are all in the collection. The most interesting specimen, however, is labeled "Bovista castanea," and was collected by Drège in South Africa. *It is Catastoma juglandæforme*, the curious conidial spored Gastromycetes we have already considered (cfr. Myc. Notes, p. 199). *It was Drège* who collected the original "Bovista castanea," now Catastoma castaneum, which has the same appearance and peridium as Catastoma juglandæforme, but differs so markedly in the spores. When the truth of this subject is finally known, we venture the opinion that Catastoma juglandæforme will be found to be the *conidial form* of Catastoma castaneum. It is the only *conidial gastromyces* known.

Fuckel's herbarium at the Herbarium Boissier is of interest, as Fuckel published his determinations. Several of them are misdeterminations, but we can only take space to consider the "new species," of which he only published two, neither of any value.

Geaster granulosus is Geaster minimus and Geaster calyculatus according to his figure, and one of his collections is Geaster Bryantii, but he has also a collection of Geaster pectinatus with the same label.

Bonorden's eight "type" specimens in Fuckel's herbarium are of interest, not because I think Bonorden ever described many new species, but because he described thirteen that he called new, and until these eight specimens were found no one had any idea what they were, although there has been a great deal of guessing on the subject. I, of course, do not know Bonorden's handwriting, but there are twelve specimens in Fuckel's herbarium, of the same writing, certainly not Fuckel's, and eight of them are Bonorden's species. There is also on one of them a memorandum, "Scripsit Bonorden teste G. C. D.," and on another, "Bonorden Det. et Scripsit," but the writing seems English, not German style, and six of the localities are "Herford," which has an English sound. Assuming that these specimens are authentic, Bonorden's new species are as follows:

Lycoperdon laxum=Lycoperdon velatum!

Lycoperdon foetidum. Appears to me to be L. nigrum.

Lycoperdon depressum=Lycoperdon pratense!

Lycoperdon fuscum=Lycoperdon spadiceum (Myc. Notes, p. 216).

Lycoperdon cupricum=Lycoperdon fuscum (Myc. Notes, p. 210).

Lycoperdon serotinum has probably been near enough guessed in Hollós' work, which we followed, as stated at the time, so that it need not be changed. But while the spores are smooth, the cortex rather tends towards nigrum.

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† "The name 'Mycenastrum Corium' is absolutely untenable, in view of the evidence that the plant is not the same as Lycoperdon Corium Guers, on which it is based. I therefore name it Mycenastrum Kuntzei, McGinty, in honor of our great master of nomenclature, Otto Kuntze, who elucidated the laws governing such cases. I also change the name Scleroderma Geaster, Fries, to Scleroderma Kuntzei, McGinty, according to the same laws. The name Scleroderma Corium can not be used, having been applied to another plant.—*N. J. McGinty*."

Lycoperdon muricatum=Lycoperdon cruciatum (old, decorticated).

Lycoperdon ericæum seems to me to be a dark form of Lycoperdon cepæforme.

When we wrote an article on the Lycoperdons of Europe (Myc. Notes, p. 205), there were three species (viz., cupricum, fuscum, and serotinum) that we could not trace to our satisfaction. So we referred them to Bonorden's species, as interpreted by Dr. Hollós, so stating in each instance. If these specimens at Geneva are authentic, it appears now that our definitions of these three names in our article are none of them exactly right.

In Fuckel's collection is a specimen of Lycoperdon tessellatum, the first we have seen from Europe (Cfr. Myc. Notes, p. 230). There is also a specimen labeled "Lycoperdon æstivale, Bon.," but in Fuckel's writing. However, we think it is correct, as it does not disagree with the "description." It is a *Bovista*, the brown form of Bovista plumbea which Berkeley called Bovista brunnea.

NOTELETS.

GEASTER SMITHII.—We noted on page 287 an account of the re-discovery of this rare plant in Australia. We have just received a third collection from A. Tietz, of Adelaide, South Australia.

ARCHÆOLOGY.—We recently visited Rome about the same time as our fellow-countryman, Mr. Murrill, of New York. There was a rumor among the guides that the object of his visit to Rome was a search for old botanical names in the catacombs.

TYLOSTOMA LEVEILLEANUM.—We have already given our reasons for believing that this plant was named by Léveillé, and not by Gaudichaud, as would appear from the advertisements. At Geneva there is further evidence on the point. Gaudichaud sold a set of specimens to Delessert, and among others this plant. It bore no name whatever, and it is passing strange that a botanist should distribute unnamed specimens of a plant which he himself had named.

A NEW RULE.—We understand there is a movement on foot to authorize at the next Botanical Congress the use of Chaldean, Sanscrit, and Coptic languages in the formation of plant names. It seems that since Fries's day the demand for new names to replace the sections of Fries's genera has about exhausted the possibilities of the Latin and Greek languages, and there is pressing need for a wider field of choice. As every writer feels it incumbent upon himself to propose an entirely new set of names for each section of Fries's genera, the late comers are becoming embarrassed to find enough new names.

CALVATIA RUBRO-FLAVA.—As we have previously stated (p. 149), this plant seems restricted to cultivated ground. Mr. H. B. Dorner, Lafayette, Ind., who is the only one of my correspondents who finds the plant abundantly, writes me: "I find Calvatia rubro-flava plentifully in our cultivated fields. As yet I have never found it in woods, pastures, or such places." I have recently received the plant from Rev Rick, Brazil, which is the first time I have ever gotten it save from the United States, and it rarely reaches me at all.

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 24.

CINCINNATI, O. DECEMBER, 1906.

CONCERNING THE PHALLOIDS.

During a recent visit we made to Kew we spent a number of weeks in a study of the literature of the phalloids, and of the specimens to be found at Kew and the British Museum, and we have also studied those at Paris. We expect in future to devote considerable space in Mycological Notes to the phalloids. At the present time it is largely a picture study, and excepting from Europe and portions of the United States, the subject is scantily known. Professor Ed. Fischer, of Berne, Switzerland, has made a specialty of the phalloids for a number of years, and with the aid of his work we feel that we accomplished more at Kew[1] in six weeks' study than we could have done in six months had we found the literature in as chaotic a condition as we found the puff ball literature.[2] Most of the phalloids of foreign countries that are known have been described from dried specimens and the pictures that represent them reconstructed, and we think there are some pictures that do not well represent the plants. Many Australian and Ceylonese specimens were described by Berkeley in his early days, at that period of his life when he was doing good and careful work, and most of his phalloid work was well done. Very fine work has been done in recent years on the phalloids of Java by Penzig and on the phalloids of Brazil by Ed. Moeller.

The main difficulty in studying foreign phalloids is the scanty and imperfect material on which much of the past work has been based. It was largely done with dried specimens, some of them now from sixty to eighty years old. Phalloids are largely characterized by their shape, and dried phalloids are for that reason infinitely better to work with than dried agarics, all of which have very much the same or similar shapes. But color is also an important character of phalloids, and dried specimens soon lose their color.

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[1] In my opinion, there is no other institution in the world where one can study the litera-ure and material of any botanical subject so conveniently as at Kew. Practically everything n the way of literature of phalloids I found there, and the chief advantage is the convenience vith which the books may be consulted.

[2] Prof Fischer has done good work on phalloids, and the only criticism we would offer is hat he fills his papers too full of personal authorities for names. In many respects, it re-ninds us of the society notes in the Sunday newspapers.

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

WHAT IS A PHALLOID?—We presume there are very few of our readers who do not recognize a phalloid when they see one growing. They have one *strong* character in common, they are excessively fetid. Always fleshy plants, often bright colored, they assume most strange and bizarre shapes, and are objects that quickly attract the eye (and usually repulse the nose). Phalloids when young are enclosed in a gelatinous volva[3] or egg (fig. 131) from which they usually develop very quickly, often in a few hours. The spores of the ripe phalloid are produced in a greenish, mucilaginous mass, which generally has an excessively fetid odor. This odor, as repulsive as it may be to us, serves a useful purpose for the plant as it attracts flies that are a means of dispersion of the spores. We shall not enter here into a review of the classification of the phalloids. That we hope will come later. We shall adopt the names in general use, following Professor Fischer very closely except in a few instances where he has proposed innovations that we feel are not as good classification as the older methods.[4] Our first few articles on the subject we shall devote to a consideration and illustration of specimens that have reached us from our correspondents or are familiar to us from our own collections.

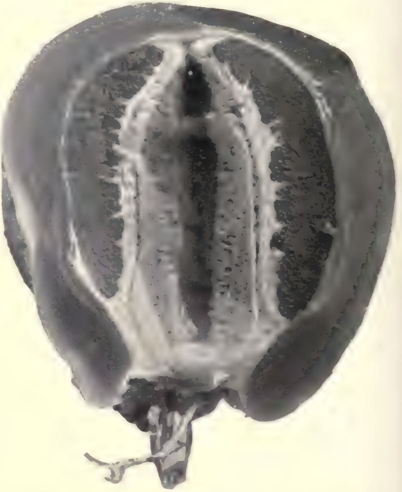

Fig. 131.

CLATHRUS GRACILIS (Plate 91).—We have received from H. S. James, Hamilton, Victoria, Australia, and from J. T. Paul, Grantville, Australia, alcoholic specimens of Clathrus gracilis. This seems to be a frequent species in Australia and is well represented by dried specimens at Kew. While we believe that our photograph (Plate 91) made from alcoholic specimens will give a crude idea of the plant, a photograph made from a fresh plant is much desired and we hope some of our Australian correspondents will have a photograph made for us from a fresh specimen. Berkeley described this species as Ileodictyon gracile,[5] and gave a good figure of it in 1845. The genus Clathrus, in which we include the plant, was proposed by Micheli for the only species that grows in Europe or the United States (C. cancellatus). We would refer to the genus Clathrus all phalloids that have an unstalked receptacle, consisting of a net or latticed structure, and subglobose in shape. The color of Clathrus gracilis is pale or white. The branches of the mesh are flattened, even, very narrow and slender, varying from 2 to 3 mm. broad. They form a coarse net work with large meshes sub-equal in diameters.[6] The gleba in the young plant completely fills the interior of the mesh (see Plate 91, fig. 5). As the plant expands the gleba deliquesces and remains spread evenly over the inner side.

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[3] We do not exclude from the phalloids the genus Phallogaster, which has the main characters of a phalloid, but is devoid of a volva.

[4] Thus the genus "Clathrella" does not appear to us as being well founded. Laternea is for us a very distinct genus from Clathrus. There never were good grounds to sink the old name Phallus and substitute a new name Ithyphallus.

SYNONYMS.—As previously stated the plant may be called Ileodictyon gracile if we consider this section of Clathrus a distinct genus. Prof. Fischer unites Clathrus gracilis to Clathrus cibarius, and it must be admitted they are very similar. However, in Clathrus cibarius the arms of the net are four or five times as broad as those of Clathrus gracilis. While intermediate specimens may occur, we have never seen them and all the specimens at London and Paris are very distinct. Besides there is a geographical difference. Clathrus cibarius is the New Zealand species, Clathrus gracilis the Australian. Of the many specimens we have seen not a single Clathrus gracilis from New Zealand and but one Clathrus cibarius from Australia. The strongest point, however, that would indicate to us that the two species are distinct is the structure of the net work. In Clathrus cibarius it consists of a single, large tube (see Plate 91, fig. 8). In Clathrus gracilis it shows from two to four united tubes (see Plate 91, fig. 6).

CLATHRUS CIBARIUS (Plate 91).—Clathrus cibarius of New Zealand is a very similar plant to the preceding, but much larger with broad arms to the net work. The width of the flattened arms is a centimeter or more. The plant was described by Tulasne in 1844 from specimens in alcohol, collected by Raoul in New Zealand, and now preserved at the Museum of Paris. It was said to have been eaten by the natives, hence the name, cibarius. The plant is known in Europe only from alcoholic specimens (which have the arms much wrinkled) and from pressed specimens (Plate 91, fig. 7) where the arms are flattened. The natural shape of a section of the arm is unknown, I think. A photograph of a fresh specimen is very much desired. As we do not have such photographs we give (Plate 91) a reproduction from a dried specimen, which at the best will give but a crude idea of the plant. Clathrus cibarius is the type of the genus Ileodictyon (see note page 295) and is a very similar plant to Clathrus gracilis of Australia. It is not confined to New Zealand. Specimens are in the museum at Paris from Chile and at the British Museum from Chiloë (an island off the coast of Chile) which in all respects agree with the New Zealand plant. It is also reported from South Africa.

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[5] The genus Ileodictyon, proposed by Tulasne, differs from Clathrus proper in having larger meshes to the net work, and (the original species) in having the branches of the net formed of a single hollow tube. In the species under consideration, Clathrus gracilis, this tube has partitions, being composed in fact of two to four tubes. There are several species described from dried specimens where the structure of the branches is unknown, and we feel it simplifies matters to consider Ileodictyon as a section of Clathrus. In some of Prof. Fischer's works, he takes this view of it; in others, holds the genus Ileodictyon distinct. We believe that the genus Ileodictyon is a good genus and that it differs from Clathrus in having *tubular* arms, while Clathrus proper has arms composed of large cells not tubular. We can not apply this distinction, however, to much of the material on which our knowledge is now based.

[6] Some species of Clathrus (C. pusillus) have the lower branches sub-columnal, forming elongated meshes.

FORM FROM BRAZIL.—At the British Museum there is a specimen collected by G. A. Ramage, Pernambuco, Brazil, which is certainly a distinct form if not specifically distinct. It has the general appearance of Clathrus cibarius, but the arms of the upper meshes are narrower than those of the lower and the latter are somewhat columnar so that the lower meshes are elongated.

CLATHRUS CANCELLATUS (Plate 92).—We can not hope in an uncolored plate to do justice to Clathrus cancellatus. It is a most gorgeously bright, red plant and must be reproduced in color to give a good idea of it. Fortunately colored plates are not rare. Cooke, Barla, Bulliard, Mrs. Hussey, and others perhaps that we do not now recall, have all given excellent plates of it. The plant can not fail to be recognized from our plate even though uncolored as it is as striking in shape as in color. We feel that no description is necessary, but will mention that it has the reputation of being among the most fetid of phalloids. Its odor is so strong that Mrs. Hussey states it was with difficulty that she managed to complete the drawing of it. The odor of phalloids has been compared to rotten fruit, carrion, etc., but we think Sowerby has it nearly right when he states that the "smell is peculiar to itself."

DISTRIBUTION.—This plant is frequent in the "Midi" and "Bretagne" of France, in Italy and southern Europe in general.[12] Also in the islands of the Mediterranean and northern countries of Africa. It does not occur in France as far north as Paris, but is found on the Isle of Wight and a few stations in southern England.[13] We have seen a specimen from Switzerland.[14]

In the United States it is a very rare plant. Fine specimens, collected in Florida, are in the museum at Harvard, and it is recorded from Georgia.[15]

The species has been recorded from Ceylon and New Zealand, but both we think are based on erroneous determination.[16]

SYNONYMS.—This plant was well illustrated by Micheli nearly two hundred years ago, and the name Clathrus cancellatus was based on his figure. It has been fortunate in escaping almost all synonyms and there has never been the slightest excuse for name juggling. Bulliard called it Clathrus volvaceus, and Barla is said to have named it Clathrus nicæensis.[17]

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[12] From Dr. Hollós' book we learn that it is absent from Hungary, which is surprising, as it appears that the gastromycetes flora of Hungary is of a southern type.

[13] Professor Massee tells me that the plant has reached him from English correspondents on three occasions: from Bournemouth, southern England, from Haslemere, near London; and once was collected on the banks of the Thames, near Windsor. He also informs me that it is usually found in fir woods which I did not know.

[14] I am told that in some of the deep valleys on the southern side of Switzerland, the climate is quite warm, and the vegetation is of a southern type.

[15] We should be glad of other authentic records in the United States. It is stated by Cragin that it grows in Kansas; but we have not much confidence in his determinations. The New York record is doubtful, we think.

[16] We fully agree with Prof. Fischer that the specimens from Ceylon are Clathrus crispatus, a very distinct species, and from New Zealand, Clathrus cibarius.

[17] We are unable to confirm this. In Barla's "Champignons de Nice," a beautiful plate is given, under the name Clathrus cancellatus.

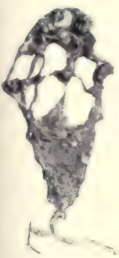

Fig. 132.

CLATHRUS DELICATUS (Fig. 132). — The most delicate and unique little Clathrus ever discovered is Clathrus delicatus of Ceylon. But one collection is known (now at Kew) which was made in 1868 at Peradeniya, growing "on rotten cocoanut husks." The gleba adheres in little globules to the angles of the meshes. Some idea of the diminutiveness of this unique, little species can be gained from our figure (132) which is an enlargement (*four diameters*) of the type specimens at Kew. Berkeley described but did not figure it.

SIMBLUM SPHÆROCEPHALUM (Fig. 133). — The genus Simblum can be described in a few words as being a Clathrus on a stem. At present there are four species known: Simblum periphragmoides, the original species from Mauritius, which was published and well illustrated by Hooker; Simblum gracile, which appears to be common in Ceylon and the East Indies and is very similar to the preceding but much more slender; Simblum sphærocephalum, very common in South America and very rare in North America; and Simblum Texense, which Mr. Long finds abundant in Texas, but which has not yet been published.[7] It is very close to Simblum sphærocephalum but is yellow instead of red. Simblum sphærocephalum is well illustrated in the photograph we present herewith (Fig. 133) which was made by Rev. J. Rick, Brazil. The specimen is evidently abnormal, having two stems and a single head. It is an excellent photograph and gives a good idea of the clathrate structure of the receptacle. It is a very common plant in South America, as is evident in all literature.[8] It usually has a red stem, as the names that have been applied to it, "rufescens" and "coccinea," indicate. Rev. Rick states that it sometimes has a white stem in his locality. In North America it is exceedingly rare. We have given in Mycological Notes, page 220, all the stations known to us.[9]

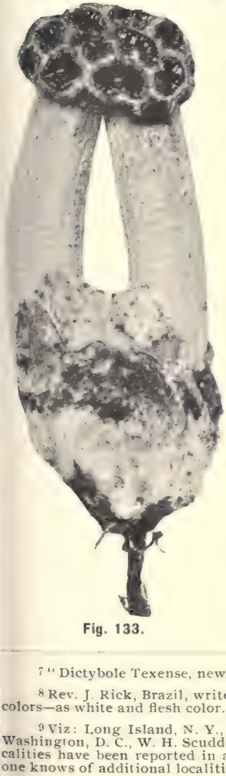

Fig. 133.

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[7] "Dictybole Texense, new genus, Atkinson," I am informed is based on this species.

[8] Rev. J. Rick, Brazil, writes me: "It is *very common* here, and has a variety of forms and colors—as white and flesh color. I have collected both colors from the same mycelium."

[9] Viz: Long Island, N. Y., Gerard; Nebraska, J. M. Bates; Kansas, E. E. Bartholomew; Washington, D. C., W. H. Scudder; Talbot County, Maryland, Charles McIlvaine. No other localities have been reported in answer to our request on page 220. We beg to ask again if any one knows of additional localities that he will write us and favor us with the data.

HISTORY.—As has been established by Professor Fischer, the plant was first called by St. Hilaire, Foetidaria coccinea.[10] He gave no figure of it and as the genus Simblum had been well illustrated no one had any idea what was referred to under the "new genus" Foetidaria,[11] until Fischer decided from other evidence what the plant probably was. Schlechtendal named it Simblum sphærocephalum and gave a very fair illustration, although I do not think any phalloid has such a volva as he shows. When Gerard found the plant on Long Island he gave a good illustration of it and called it Simblum rufescens. Cragin found it in Kansas, and as everything he found was new, it was Simblum rufescens var. Kansensis. I have seen a figure of the type specimen of "Simblum pilidiatum, Ernst," and it is certainly the same plant.

LATERNEA COLUMNATA (Plate 92).—The genus Laternea differs from Clathrus in having the arms (usually three to five) disposed in a columnar manner, united at the top but *not* forming a network.[18] Laternea columnata is a very common plant in our Southern States, particularly in Florida. How far north it extends I do not know, but I think the record of Clathrus cancellatus from New York was based on this species (Cfr. Myc. Notes, p. 150), and Rafinesque's reference "Pennsylvania" surely was. I should be glad of any authentic records of its occurrence in stations in any degree northern. It is found also in the West Indies and South America. West Indian plants that I have seen are more slender than the American plant, but those from South America[19] seem the same in every particular. It is doubtful if the plant occurs in New Zealand.[20]

We do not give any description of Laternea columnata as our plate is the best description we can give. The plant is red and exceedingly fetid. In Florida it is known to the natives as "Dead Men's Fingers."

Since this page has been in type we have received from C. E. Pleas, Florida, a fine photograph of Laternea columnata, better than those we present on our plate (*92*). We regret that it was received too late to be inserted here, but we will not fail to reproduce it in our next article on the phalloids. Good photographs of phalloids are what are particularly needed to make the subject plain.

HISTORY.—Bosc gave a good figure of this plant in 1811 from specimens collected in the southern United States and called the plant Clathrus columnatus Turpin proposed the genus Laternea in 1822 for a three-columned plant (Laternea triscapa) that he figured (Fig. 134) from specimens from a little island, Tortuga near San Domingo. Nees von Esenbeck transferred the American plant to the genus Laternea. For a long time it was supposed that the number of columns (three) was the specific character of Turpin's species and three-columned specimens of Laternea columnata have been so referred. It is now known that the number of columns varies in Laternea columnata: usually four, they are sometimes three and sometimes five. Turpin's figure is only about one third the size of the American species, with very slender columns, and if any specific difference exists it is in the general size of the plants, not in the number of the columns. Turpin's plant has never been refound unless Berkeley's little Laternea pusilla from Cuba is a small form of it, but Laternea pusilla is as much relatively smaller than Laternea triscapa as that is smaller than Laternea columnata. Laternea columnata collected in Brazil was at one time called by Prof. Fischer Clathrus brasiliensis, and at another time Clathrus cancellatus var. brasiliensis, and at one time he called the American plant Clathrus cancellatus, var. columnatus. He has since receded from all these opinions, and it is quite evident the species is no form of Clathrus cancellatus. It is almost certain that Laternea columnata is what Rafinesque called the genus Colonnaria (Cfr. Myc. Notes, p. 129) and although the name is much prior to Laternea the name juggler has not yet appeared, who no doubt will present himself in good time and propose a "new combination."

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[10] Prof. Fischer very sensibly refrained from juggling it, the plant being well established under Schlechtendal's name. My friend Prof McGinty, has no such scruples, and proposes for it the new combination "Simblum coccineum, St. Hilaire, McGinty." There does not seem to have been any specimen sent to Europe by St. Hilaire, not even a crude figure, and all that can be known of it is by working backward, a favorite method with modern name jugglers

[11] When "rules" are made for the naming of cryptogamic plants, I hope proper consideration will be given to that large element of "new species" makers who do not know when their plants belong to old and well-known genera.

[18] There are a number of species of Clathrus that have the lower arms disposed in a somewhat columnar manner, but developing into a network above.

[19] Rev. J. Rick, Brazil, writes me that "many forms" of the species occur with him.

[20] At Kew there is a specimen, collected by T. Kirk, at Lynton Downs, New Zealand, which, to me, has the appearance of being an obese form of Laternea columnata, but it is so broken and in such condition that I am not at all sure.

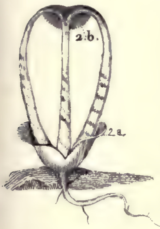

Fig. 134.

MUTINUS ELEGANS (Plate 93).—The genus Mutinus has a single stem or stalk (receptacle it is called) bearing the gleba directly on the upper portion of the stem. It will be recognized at once from our figure. Around Cincinnati it is perhaps the most common phalloid we have. What its geographical distribution is I do not know, but it occurs as far west as Missouri (Dr. Glatfelter) and as far east as Pennsylvania (Dr. Herbst). I judge from Prof. Burt's writings that in the extreme east it is mostly replaced by other species. The color of Mutinus elegans is flesh color or deeper red. The form, thicker below and tapering above, is characteristic of the plant as it grows at Cincinnati, and to my mind is its specific character. Whether the "club-shaped" plant which we now call Mutinus Ravenelii is only a form of Mutinus elegans, or whether it is a distinct species we are undecided, but we feel quite sure Mutinus Ravenelii is not Mutinus caninus of Europe, as has been stated.

HISTORY.—Sullivan sent from Columbus, Ohio, a figure of this plant and a specimen to Montagne, who labeled it in his herbarium "Caromyxa elegans," but did not publish it until after Berkeley had published "Corynites Ravenelii," when it was published (Sylloge 1856, p. 281) as Corynites elegans. The specimen is still in good condition in Montagne's herbarium. Berkeley published the plant in 1873 as Corynites Curtisii (changed by Fischer to Mutinus Curtisii) and the type at Kew is characteristically this species. Morgan gave a good figure of it and published it in 1889 as Mutinus bovinus, and as he was the first to give a description and figure from which the plant could be recognized, we would accept his name if it were as good as his figure.

MUTINUS RAVENELII (Fig. 135).—There occurs in the United States a species very similar to the preceding but which is smaller and *club shaped,* being broader above and tapering below. This plant was named by Berkeley, Corynites Ravenelii. It seems to be a common form in the eastern states but is rare in the west and I have never seen it at Cincinnati but once. It has the same structure as the previous species Mutinus elegans, but differs in form only. Whether it is a form of Mutinus elegans or a distinct species I have no opinion at present. I should be glad if the readers of Mycological Notes would observe this season the forms of Mutinus and advise me if they find both forms in their section, or only one of them, or any other information that will aid in clearing up this question. Prof. Burt, in his recent excellent paper on the phalloids, has referred Mutinus Ravenelii as a synonym for Mutinus caninus of Europe. In this we feel quite certain he is mistaken. Mutinus caninus will be considered and illustrated in our next issue. It has a structure quite different from the specimens of Mutinus Ravenelii. The gleba bearing portion of the plant is very short, abruptly contracted, formed of small cells, quite different from the large cells of the stem of the plant. The gleba is *definitely limited* to this portion of the plant and is a thick layer, so at first sight the plant appears to have a cap or pileus. When Berkeley described Corynites Ravenelii he specially pointed out that the receptacle is uniform in its cellular structure and the gleba is not definitely limited, and on this difference from the structure of Mutinus caninus he based the genus Corynites. Prof. Burt, in his paper, correctly gives the structural characters of Mutinus caninus and he is a very careful observer and records the species frequent with him. We have received a specimen of Mutinus caninus from James Fletcher, Canada, hence we have in the United States, I think, three species or forms of Mutinus, viz: Mutinus elegans, Mutinus Ravenelii, and Mutinus caninus. I should be glad to receive any specimens or information that will throw light on the subject. It is quite evident from Ravenel's herbarium at the British Museum that he did not consider the shape (as we have in this paper) as the character of Mutinus Ravenelii. His type specimen "No. 888" (concerning which he writes a long letter insisting that it is the "true type") is club shaped, but his sketch that accompanies it is the shape of the plant that in this paper we have called Mutinus elegans.

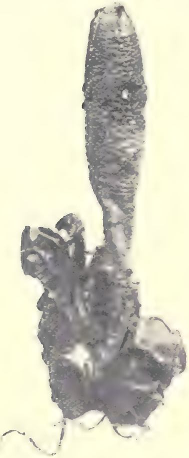

Fig. 135.

CONCLUSIONS.—We expect to continue in the succeeding numbers of Mycological Notes a consideration of the phalloid subject until the leading species are considered and illustrated. We shall be very glad to receive from our friends and correspondents any notes, specimens (dry or alcoholic), photographs, or information that may aid in the work. We append a list of the dried specimens that have thus far reached us. We have a number of additional alcoholic specimens in our museum at Cincinnati, but the list is not available here in Paris.

Specimens in our Collection.

Aserœ Hookeri, *New Zealand*, Miss Jessie Dunn.

Clathrus cibarius, *New Zealand*, Miss Jessie Dunn.

Clathrus crispus, *Jamaica*, Miss Barrett.

Clathrus cancellatus, *Portugal*, Rev. Torrend; *Italy*, M. Bezzi; *France*, L. Rolland; *Spain*, T. de Aranzadi.

Clathrus gracilis, *Australia*, J. T. Paul, F. Reader.

Kalchbrennera corallocephala, *South Africa*, J. M. Wood.

Laternea columnata, *Florida*, C. E. Pleas.

Laternea pusilla, *Jamaica*, W. Jekyll.

Mutinus caninus, *Canada*, Jas. Fletcher; *Ireland*, Greenwood Pim; *Germany*, C. Engelke, Otto Japp.

Mutinus elegans, *Cincinnati*, C. G. Lloyd.

Mutinus Ravenelii (?), *New Jersey*, E. B. Sterling.

Phallogaster saccatus, *Ohio*, C. G. Lloyd, and also at *Eglon, W. Va.*

Phallus aurantiacus, *Hawaii*, D. D. Baldwin.

Phallus duplicatus, *Iowa*, L. R. Waldron; *Ohio*, C. G. Lloyd.

Phallus indusiatus, *Jamaica*, H. E. Cox, Miss Barret; *Samoa*, C. G. Lloyd.

Phallus imperialis, *Italy*, M. Bezzi; *Colorado*, E. B. Sterling; *Texas*, W. H. Long, Jr.; *California*. L. G. Yates; *Washington, D. C.*, F. J. Braendle. (Note.—Phallus imperialis is only a form of Phallus impudicus with pink volva, but it appears to be the only form that occurs in the United States. In England it is a very rare form and Prof. Massee tells me that while Phallus impudicus is a very frequent plant in England, he has seen the form imperialis but once. Monsieur Boudier tells me he notes a distinction in habitat and in odor of the two plants at Paris.)

Phallus Ravenelii, *Pennsylvania*, Wm. Herbst; *Iowa*, F. J. Fitzpatrick.

Phallus rubicundus, *Texas*, W. H. Long, Jr.

Simblum sphærocephalum, *Nebraska*, Rev. J. M. Bates.

Simblum Texense, *Texas*, W. H. Long, Jr.

THE COMMON BIRD'S-NEST FUNGI.

We have just finished work on a monograph of the Nidulariaceae. As it embraces all known species, both rare and common, including many species found only in the tropics, we feel that it will be of less interest to our general readers than an account of our common species which every one meets. There are *but four* common species of bird's-nest fungi, either in Europe or the United States, and as far as I know and believe only five rare ones. Of the one hundred and seventy-six specimens we have received from correspondents one hundred and sixty-five belong to these *four* common species. We do not include in the above summary Sphaerobolus stellatus, which although it has the same general structure as the family, has but a single peridiole, and is not in the popular mind associated with bird's-nest fungi. Every child knows the little cups that they liken to little birds' nests filled with little eggs. In botanical language the cups or nests are known as the peridium and the little eggs as peridioles.[1]

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[1] This is the term that I shall employ for them, though it is not strictly correct, the word sporangioles being more frequently used.

Each peridiole (in all our common species) is attached to the peridium by a slender cord (called funiculus) which when wet is elastic and capable of long extension. The peridioles of all these four common species are black, but three of them have what is known as a tunica, a thin, white membrane surrounding the peridioles. Crucibulum vulgare alone has a tunica thick enough to hide the color of the peridioles, and hence is the only species with white "eggs." Our four common species differ widely from each other, so that there is no trouble in naming them from their general appearance and habits. The peridioles are filled with microscopic spores, and the most marked difference to the mycologist is the relative size of these spores, but that is not a question that we shall consider here, as the object of this article is to give a general description by which our common species can be readily known without the use of the microscope.

CRUCIBULUM VULGARE (Fig. 136).—We present a figure of this plant growing on a piece of old mat. Its usual habitat is sticks, chips, etc. Sometimes, very rarely, it grows on cakes of manure, but it never I think grows on the bare ground. The cups are subcylindrical in shape, not so tapering as the other species, and the color when young yellowish, and it is the only species of this color. When old the cups bleach out and lose their yellow color. The mouths of the young specimens are covered with a thin, *yellowish* membrane (called the epiphragm), and most of the specimens in our figure still have the epiphragm. The peridioles (or "eggs") are white,[2] and this is the only bird's-nest fungi that has white eggs. There should, therefore, be no trouble in recognizing Crucibulum vulgare by its yellowish color and white eggs.

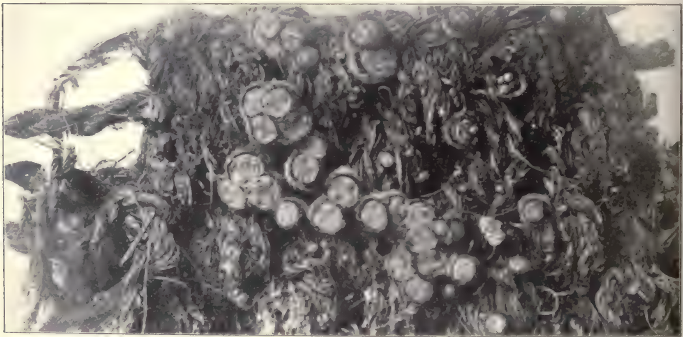

Fig. 136.

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[2] For the purposes of this article, in reality it is the tunica a membrane that surrounds the peridioles that is white.

CYATHUS STRIATUS (Fig. 137).—This species is usually found on sticks, sometimes in the ground, but then attached to buried sticks. While Crucibulum vulgare has more of a "domestic" nature, being found often around houses, on chips in the wood yard, on board walks, etc. Cyathus striatus has more of a wild nature, and is generally found in the woods on brush heaps, etc. It can always be known by the striations or lines on the inside of the cups as shown in our figure. Cyathus striatus is the only species in the United States or Europe that has these marks.[3] The color of the cups is dark brown or black, and the European form is darker than the American.[4] The peridioles of Cyathus striatus only fill the lower part of the cup below the striations. They have a thin, whitish, surrounding tunica, but the eggs would be called black. I think there can be no trouble in recognizing Cyathus striatus *from its striations.*

Fig. 137.

CYATHUS VERNICOSUS (Fig. 138).—This is the only species that is likely to be found growing in the unmanured ground. Sometimes it is attached to buried sticks, but it rarely if ever grows on wood as the other species usually do. Like Cyathus striatus, it is rather of a wild nature, being usually found on bare ground in fields, borders of woods and similar places. It is readily known by the

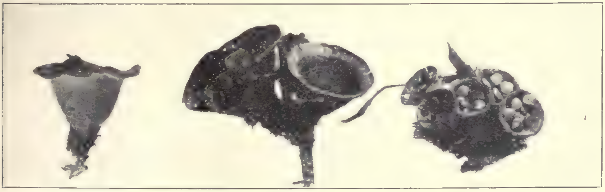

Fig. 138.

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[3] In warm countries there are several species of this character.

[4] The American plant is a distinct form called var. Schweinitzii and differs from the European not only in lighter color but in the structure of the tunica.

cups which are thicker, firmer, more flaring, smooth inside and smoother outside than other species. The "eggs" or peridioles are black (though covered with a very thin, white membrane) and they are much larger than any other species known (usually 3 mm. in diameter).

CYATHUS STERCOREUS (Fig. 139).—This is the manure-loving species, and is usually found on cakes of manure or in manured ground, such as gardens, lawns, fields, etc. The cups are even inside, and with shaggy hairs outside. When old they become smoother, and are sometimes mistaken for Cyathus vernicosus.[5] However, when once learned, the plants can be readily distinguished by the cups. Cyathus stercoreus varies considerably, however, as to shape and size of cups, according to habitat. If growing on cakes of manure, they are shorter, more cylindrical; if in loose, manured ground, especially in grass, they are more slender and inclined to a stalk at the base. The latter form is called Cyathus Lesueurii. The peridioles or "eggs" of Cyathus stercoreus have no tunica whatever,[6] hence they are blacker than other species. All three of the other common species are equally abundant, both in Europe and the United States, but Cyathus stercoreus, while very common in the United States, is *very rare in Europe*. I have seen in a garden near Cincinnati the ground under currant bushes covered for yards in extent with the little cups as thick as they could stand.

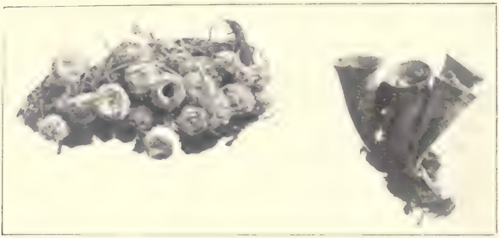

Fig. 139.

We have presented the four common species of Bird's-nest fungi in such a manner that we feel they should be easily recognized. And these four are all the species that most of our readers will ever find.

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[5] A picture of the species is published in Miss Marshall's book and labeled Cyathus vernicosus. There is no good reason why any one who examines the spores should confuse the two plants as Cyathus stercoreus has *very large*, subglobose spores, 30 to 50 mic. while vernicosus has small, elliptical spores, rarely 15 mic. long.

[6] This contradiction of what Tulasne states as to the same plant is only a contradiction as to terms. What Tulasne called the tunica in this species is for us the outer coat of the peridiole itself and is of a different nature from what we designate as a tunica.

FREAK PUFF BALLS.

When Léveillé described his "Hippoperdon Pila" (Cfr. Myc. Notes, p. 178) he was very positive he had a perfect plant. We think we have demonstrated that he was entirely mistaken and that what he had was the *sterile base* of Calvatia lilacina. If Léveillé had had the specimen that is before us now, which we have just received from Miss Jessie Dunn, New Zealand, he could well have claimed that he had a "perfect plant," that is, an entire plant, for the specimen (Figs. 140 and 141) is certainly perfect and complete. It consists entirely of tissue such as one ordinarily finds in sterile bases, and there are a *very few* globose, echinulate spores to be found in the tissue.

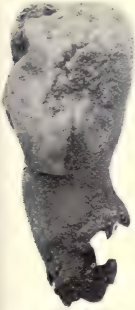
Fig. 140.

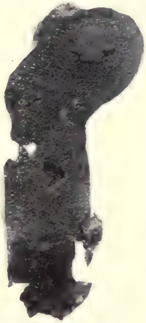
Fig. 141.

In my opinion it is only a "freak." The real relation of the "sterile base" to the "fertile portion" of a puff ball is, I think, not known. Professor Patouillard tells me that one finds in the young sterile bases a *hymenial layer* and *basidia.* Why they remain mostly sterile and do not produce spores is a question for the cytologist to solve. Whatever the cause may be it is curious that Miss Dunn should find an example that is, at the same time, a perfect puff ball and a perfect sterile base.

While on the subject of "sterile bases," it is really amusing as we look back at it—the theories that some of the old mycologists had to explain "sterile bases." Bosc, who figured one,[1] was very much puzzled to explain its dehiscence. He states, 'I have never seen it open naturally to spread its seeds. It is the insect which perforates it, the feet of the quadrupeds which crush it, the winds which bruise it against the trees, that supply the defect." If the explanation was not true, it was at least ingenious.

THE GASTROMYCETES OF MISS MARSHALL'S BOOK.

Miss Marshall wrote her "Mushroom Book" as a kind of commentary on some photographs by J. A. and Miss H. C. Anderson. The plates are excellent and much better than the text. The book, however, is a good introductory work on American mycology, and I think stands next to Atkinson's, but both are primers. A good text book of American agarics is much needed. The only man in America, I think, who has the practical field knowledge to write a book of much service, is Professor Peck, but he is so busy that he does not find time.

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[1] He called it Lycoperdon cyathiformis, and some would on that account call Calvatia lilacina, Calvatia cyathiformis. When we get the much talked about "rules," when one can put a nickel in the slot and draw out a valid name, we hope it will be made definitely clear what value these old "cul de jatte" have in nomenclature.

The following plates of Miss Marshall's book are very fine and are correctly named: Lycoperdon piriforme, Calvatia craniiformis, Bovistella Ohiensis, Geaster minimus, Geaster hygrometricus. The following plates are better than the names: Calostoma Ravenelii (= Mitremyces), Calostoma lutescens (= Mitremyces), Scleroderma vulgare (= Scleroderma aurantium), Calvatia cyathiformis (= Calvatia lilacina). The figure of the latter is more globose than is characteristic of the species as it generally occurs. Calostoma cinnabarinum (= Mitremyces) does not appear to me as good as those of the other two species, both of which are very fine and the best figures I know of them. Lycoperdon subincarnatum is good, but larger specimens than usual. The two following are misdetermined and misnamed: Cyathus vernicosus is a characteristic figure of Cyathus stercoreus. Mutinus caninus is Mutinus Ravenelii, quite different from Mutinus caninus of Europe.

AN UNKNOWN SOUTH AMERICAN LYCOPERDON.

It seems superfluous to us to put the above head in the singular number. All puff balls of South America are practically unknown in Europe, for while many species have been named and described, there is no way to even guess with any degree of certainty what they really are. Not a great many specimens have reached us from South America, but such as have are practically all old and well-known plants of the remainder of the world, and there is nothing to indicate that the species of South America are not in the main the same as those of other parts of the world. The following species, however, impresses me as being very different from all others as far as I know. When I first saw it I thought it was a subglobose form of Lycoperdon fuscum.† The same cortex, color, appearance, and with a *decidedly purple cast of the gleba.* All Lycoperdons that I have seen that have distinctly *purple* gleba have *large, rough* spores *mixed with fallen pedicels.* (Cfr. Myc. Notes, p. 221.) We were greatly surprised in consequence to find that under the microscope these plants have *small, smooth* spores and *no trace of pedicels.*

LYCOPERDON SEPTIMUM (Fig. 142).—Peridium subglobose, with a strong root, *dark* in color. Cortex minute, stellate, dark, nodular spines (Fig. 143 enlarged). Sterile base none. Gleba umber-purple. Capillitium deeply colored. Spores globose, *smooth,* 4-5 mic., unmixed with pedicels. We have named this plant "seventh" in reminder of the fact that it belongs to the seventh section of a recent paper on the genus Lycoperdon, and is the only species we have seen (and we have seen all so included) that does belong there.

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† We shall continue to use the name Lycoperdon fuscum in the sense that we have published it, Myc Notes, p. 210, notwithstanding that a chance discovery since of an authentic specimen from the original user of the name has shown that his was quite a different plant.

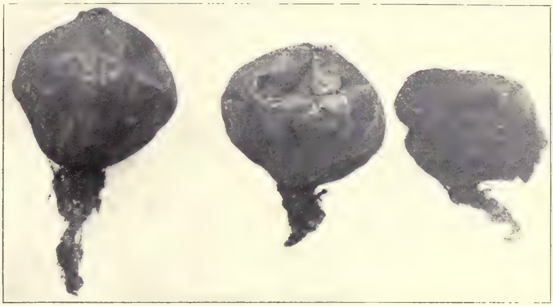

Fig. 142.

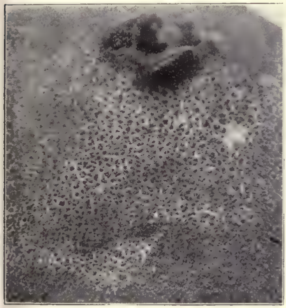

Fig. 143.

Save as to absence of sterile base, the plants in the grosser characters are the same as Lycoperdon fuscum.

Specimens collected at Quito, Ecuador, by Rev. L. Mille, S. J.

In evidence that the plants of South America are mainly the same as those of the remainder of the world, Rev. Mille sends also Calvatia lilacina, Lycoperdon cruciatum, Lycoperdon polymorphum and Lycoperdon Wrightii (!!), and Theodore Stuckert (Argentina) sends Geaster mammosus, Myriostoma coliformis, Lycoperdon cruciatum and Cyathus stercoreus. All the above are well-known species of Europe and America.

PRIORITY CHANGES.

We read in the last volume of Saccardo that it is proposed to change "Strobilomyces pallescens, Cooke and Massee" to "Strobilomyces excavatus (Kalch.) Hennings" because Kalchbrenner called an Australian species of Strobilomyces "Secotium excavatum." We do not question the truth of it, in fact we can confirm it as far as the generic question is involved, for we have seen the "type" specimen. But when Kalchbrenner called a Strobilomyces a Secotium he blundered as badly as if he had called an Edam cheese a big red apple. We fail to see that such work as that has any claim on science, and would be just as willing to change the name of a Strobilomyces on that account as we would be to change the name of Bovista pila because the Piute Indians call it Dza-wahp-abe-sah. Saccardo, it can be said much to his credit, does not usually pay much attention to such changes. He dismisses the entire work of Mr. Murrill with a foot-note, "He has taken anew and wrongly many old, indefinite, heterogeneous names, entirely unemployed." But it seems that with Saccardo name-juggling, like kissing, goes very much by favor. If it is done at New York (example, Cyathia, Granularia and many others), or at Kew (example, Calostoma) or at Cambridge (example, Rhopalogaster) it is all wrong. But if it is done in Germany (example, Disciseda) or in Switzerland (example, Astraeus stellatus) it is all right. To my mind it is all equally *bad*, and I am opposed to it on principle, not on personal grounds, and I would not accept a name proposed by my best friend on earth if it smacked of name-juggling.

NOTELETS.

TYLOSTOMA EXASPERATUM.—We have given its habitat in our recent pamphlet as "branches and rotten wood" (sometimes in the ground). We concluded that it grew in the ground from examination of specimens from Rev. J. Rick, Brazil. He writes us that when it grows in the ground it is always attached to buried sticks. Tylostoma exasperatum is the only species (well known) that is truly epixylous.

THE GENUS PHELLORINA.—This genus belongs to the Tylostomaceae family, but was omitted from our recent pamphlet through oversight. We *know* but two species, however, and both were considered and illustrated in our Australian pamphlet. The genus Phellorina occurs in the United States, in Texas and Southern California, but no specimens have been seen by me on which I could pass an opinion. Phellorina Californica was based on the merest remnant of an old wintered peridium, from which nothing definite could be be told. Spegazzini has recently described a "new species" of "Xylopodium" from South America. He would do mycology a better turn if he would explain how "Xylopodium" differs from Phellorina. I am sure nobody else knows any difference.

BOVISTELLA DOMINICENSIS.—On page 283, Mycological Notes, we stated that we did not think the species had been published. We have since found the publication, Grev. 17-60. It has apparently escaped Saccardo's sweep net.

CORRECTION.—On page 19 of the recent "Tylostomeae" the word "waxy" should be "wavy."

LYCOPERDON MISSOURIENSE.—When Trelease published this "new species," which is well known now as Calvatia craniiformis, Cooke published (Grev. 17-58) that it was a synonym for Calvatia lilacina (Lycoperdon lilacinum). This caused considerable amusement in the United States, where it was known that Trelease's species has olive spores and Calvatia lilacina has purple spores. Yet acording to the specimen that Trelease sent to England, Cooke was right, for this specimen is surely Calvatia lilacina. It only shows how easy it is to be right and wrong at the same time.

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 25.

CINCINNATI, O. APRIL, 1907.

NEW NOTES ON THE GEASTERS.

Among the first pamphlets we issued was "The Geastrae," which was published four years ago. At that time we had had no opportunity to study the history of Geasters in the museums of Europe, but depended chiefly on advice from Rev. G. Bresadola in our treatment of names and synonyms. We have since seen and studied practically all the "type" specimens of the genus that exist, and we have found very little that we would wish changed, and that little has been noted from time to time in Mycological Notes. Our pamphlet was naturally devoted to the most common species of Europe and America, and a few other forms have since come to our notice that should be recorded, also a few additional notes on the species already considered.

GEASTER TRIPLEX (Plate 94).—Unexpanded plant, acute.[1] Exoperidium recurved, often the fleshy layer forming a kind of cup at the base of the endoperidium (see Fig. 144). Endoperidium sessile, globose, with a definite, even mouth. Columella prominent, persistent.

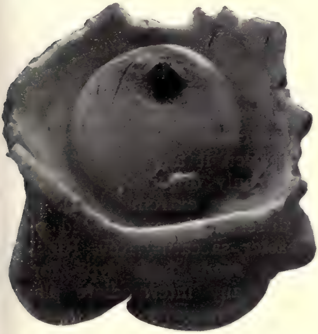

Fig. 144.

This plant is reddish brown, and is in our opinion the same as Geaster saccatus, only a giant form. Usually Geaster saccatus and Geaster triplex are very distinct (in size), but intermediate plants (such as Fig. 76 of the Geastrae pamphlet), are often hard to refer. At Cincinnati I have gathered Geaster saccatus many years and never found a form approaching Geaster triplex. In the woods of Michigan my experience is just the reverse, all Geaster triplex and no Geaster saccatus. In Samoa both forms occur, and many intermediate specimens are hard to refer. Geaster triplex was figured from Java by Junghuhn.

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[1] Unexpanded plants of Geaster triplex are always acute in varying degrees as shown in our plate 94 and I do not feel it is practicable to separate those with a distinct "beak" under a separate name. Not only do they shade into each other in all degrees but the different forms can not be known from expanded specimens.

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AT LOS ANGELES

His figure has a large cup at the base, as shown in our figure (137, made in Samoa), hence the name triplex, having three peridiums. This cup is not a peridium, but the fleshy layer of the exoperidium, and while its occurrence is frequent in the tropics, it rarely occurs in the temperate regions. Under the influence of abundant warmth and moisture the plant expands rapidly, and the outer layer of the exoperidium breaks away from the inner fleshy layer, leaving it as a cup. In temperate regions it is never so pronounced and usually does not occur at all. In addition to the synonyms given in our pamphlet. Geaster Michelianus (Gard. Chron. 73-608) is a name given it in England. Geaster Kalchbrenneri (Zoo. bot. Wien., 76-220) and Geaster cryptorhynchus (Grev. 3-162) are also synonyms in the literature of Europe. Rabenhorst distributed the plant (No. 814) as Geaster mammosus, to which species it has about as much resemblance as it has to a cauliflower.

GEASTER VITTATUS (Fig. 145).—This name was based on a plant of Australia with the exoperidium marked with lines as shown in our figure 145 (made from a fresh specimen in Samoa). It is only a form, or perhaps better stated, a condition of Geaster saccatus. As our photograph was made from a fresh plant, the lines are not due to the rupture of the surface in drying as we had always supposed. On the contrary I think they are due to rapid growth. We gathered a number of specimens of Geaster saccatus, Geaster triplex and intermediate forms in Samoa, but very few so marked.

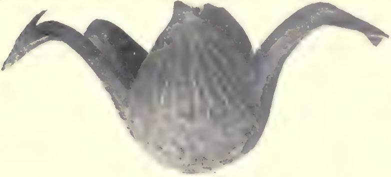

Fig. 145.

GEASTER ENGLERIANUS (Fig. 146 from the type).—In the tropics Geaster saccatus takes a black form which has been called Geaster Englerianus. It has also been called Geaster maurus. Our illustration will, of course, not show the difference between it and Geaster saccatus, as the only difference is one of color. While the extreme, black form is quite different from the red plant called Geaster saccatus, Rev. Rick, of Brazil, who sends both type forms, sends also many intermediate plants. Most of them, however, tend towards the black form.

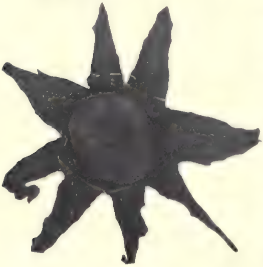

Fig. 146.

GEASTER VIOLACEUS. Rev. Rick has published this plant in Broteria. It is of a bright, violet color, and is peculiar in being the only Geaster I ever saw with a *distinctive color* departing from the ordinary black and reddish forms. Except as to color it corresponds to small specimens of Geaster saccatus, and Rev. Rick writes me that he notes connecting forms and doubts the validity of the species. It will not do to begin casting doubts on the validity of Geaster "species" on the evidence of connecting forms. If you follow up that line of work you will soon have but one or at the best but two species left.

GEASTER PERUVIANUS (Plate 95).—This plant can be described in a few words as being a large, black Geaster minimus. The endoperidium is blacker than minimus as it grows in the United States. The plant corresponds to Geaster pectinatus, except that it has an even mouth. It was collected in Peru and is preserved at Kew.

GEASTER CALCEUS (Plate 95).—This also can be described as being a large Geaster minimus, with the *endoperidium densely covered with coarse, white, granular particles.* It only occurs as far as I know in South Africa. I first saw it in the museum at Berlin, labeled Geaster granulosus[2], and have received it (also from South Africa) from Professor Plöttner.

GEASTER MacOWANI (Plate 96.)—This is the South African form of Geaster fornicatus. It differs from the type form only in having a furrowed mouth.

As is now well known, Geasters are divided into two sections, those with even and those with sulcate mouths. Geaster MacOwani really belongs to neither, being intermediate. I have seen the type specimens in the museum at Berlin, and have received specimens from Professor Plöttner. Both collections are from South Africa. Geaster fornicatus is usually a rare but widely distributed plant. (Cfr. Lyc. of Aus., p. 21.) It everywhere has an even mouth except in this South African form.

GEASTER HIERONYMII (Plate 97).—This is a black plant, very similar to Geaster limbatus. Its character is the rough, scurfy surface of the endoperidium, very similar to what is found on Geaster Berkeleyi. It is only known from Argentine, South America, and the types are at Berlin.

GEASTER AMBIGUUS. (Plate 98).—Exoperidium rigid, thick, hygroscopic, cut to 9 to 12 segments. Endoperidium *slightly* pedicellate, globose, *pale* color, minutely scurfy. Mouth concolorous, sulcate. The only collection known of this plant was made in Bolivia by D'Orbigny, and is preserved in Montagne's herbarium. It has been referred (by a gentleman who never saw it) to Geaster striatulus, from which it differs in its subpedicellate, larger, and scurfy endoperidium.

GEASTER HARIOTII (Plate 99).—Exoperidium rigid, with five to seven broad, oval segments. Endoperidium sessile, globose, *black,* with sulcate, concolorous mouth.

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[2] Geastor granulosus is a European name for Geaster minimus. The type form in America has minute granules on the endoperidium and the European plant does not differ either in size or granules. The South African plant, while only a form, is a larger plant, and the dense coat of granules is the most marked feature of it.

This plant seems to be fairly common in South America, and there are many collections in the museums (under various misnames) mostly from Chile and Brazil. In addition there is one collection at Kew, from Spain, and one at Berlin, from Martinique. I have received it from Rev. Rick, Brazil. It was sent abundantly to Montagne from South America, and referred to "Geaster umbilicatus, Fr." What Geaster umbilicatus is, no one knows, and the type is not at Upsala or at Lund.[3] Many guesses as to the identity of Geaster umbilicatus have been made, and almost every one who has published it has decided it was a different plant. The "description" does fairly well cover the South American species, but can not be it, as this is a native of warm countries, and certainly never grew in Sweden. Although I am quite familiar with the plant, and have called it in my collection Geaster Hariotii, ever since I first saw it in the museum of Paris some three years ago, I did not recognize it when I first received specimens from Rev. Rick, Brazil, for his specimens had the exoperidium recurved and a different appearance from the usual specimens in the museums. On comparison now I think they are surely the same, notwithstanding the apparent difference in the photographs (see Plate 99). I published a reference to it (Letter No. 2) as unnamed, and Rev. Rick has since published the name, "Geaster Lloydianus" (Broteria, 1905, p. 27), based on this letter. He mistakes the plant, however, and gives a figure (T. 2, f. 10) which is not the species. I therefore feel that the name Geaster Lloydianus is not tenable, and I call the plant by the name it has borne in my collection for the past three years. I named it for Monsieur P. Hariot, the curator of the herbarium, where a fine collection of typical specimens can be found. As it is a common plant in South America, it has been probably "named" by Spegazzini, but no one in Europe has any way of knowing what Spegazzini "names."

GEASTER ELEGANS (Plate 99).—Our ideas of the name Geaster elegans are taken from Vittadini's figure. We have never seen his plants, for while most of Vittadini's specimens are found at Paris and at Kew, this one is not. It belongs to the reddish series and resembles the little Geaster saccatus excepting the mouth. Geaster elegans is only a small form of Geaster Archeri. They are practically the same plant excepting size. Dr. Hollós has recently discovered that this is Geaster umbilicatus of Fries, but as it is about the fifth or sixth time the identity of Geaster umbilicatus has been discovered and each one has found it to be a different plant, I am not disposed to place much stress on it. Geaster elegans is a rather rare form in Europe. Most all the museums have specimens of the plant, as it has been distributed (always misnamed) in several exsiccatae, but it reaches me very rarely, and I think I have but one collection, from Rev. H. Bourdot, France. I do not recall this little plant in the United States.

GEASTER STRIATULUS (Plate 98).—This is one of the few names of Geasters we have adopted, of whose correctness we do not feel certain. We first received it so named from Dr. Hollós, and while we have no reason to doubt the determination, we have never been able to confirm it. It is not a frequent species, but is a widely spread one, and I have specimens from Europe, Australia, Africa and the United States. It is therefore improbable that Kalchbrenner should have been the first to receive it. I believe, in fact, that this is the original of Geaster umbilicatus of Fries, for of all of the plants that have been so referred this is the only one that I know certainly grows in Sweden. At the same time the peridium can not be described as "molli." Guessing on such subjects does no particular harm unless it is put forth as a "rule" for the adoption of the name, according to the "laws of priority."

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[3] I made a visit to Lund especially to find this "type" as I was informed that the herbarium of Retz where Fries saw the plant might be at Lund. I was told by Waldemar Bülow, who resides at Lund, and knows the local mycological matters, that the herbarium of Retz is not at Lund.

EPIGEAN GEASTERS.

The genus Geaster could be divided into two sections. First, Epigean, those that develop on the top of the ground, logs, etc.; second, Hypogaeal, those that develop beneath the surface, coming to the surface to expand. The nature of the species can be told from an examination of the mature plant. Hypogaeal species are surrounded when young by a mycelial layer, which usually persists more or less on the mature plant, carrying along with it dirt, etc., and having a ragged appearance. In some species, especially the section Rigidae, the layer adheres closely to the ground, and is torn away when the plant emerges from the soil, leaving the outer surface of the exoperidium smooth. Plants of this nature can be readily distinguished, however, from Epigean species. Epigean geasters, on the contrary, are *developed* on the surface of the ground or on logs, and hence the mycelium is basal. The surface of the exoperidium is even, smooth or more often velutinate, and can be easily known on examination. Like all other rules, this has its intermediate forms, and certain species like Geaster saccatus seem to connect the two sections. Practically all the Geasters of Europe are hypogaeal, and I know of but a single collection of an epigean species made in Europe, viz., Geaster Welwitchii, by Welwitch in Spain. Most of our species in the United States are likewise hypogaeal, but we have one epigean species fairly common, viz., Geaster velutinus. Most epigean species grow in the tropics.

GEASTER MIRABILIS (Plate 100).—Plants small, epigean, growing *caespitose* on a dense mycelium, which spreads over logs, sticks, etc. Young plant globose, about 4 mm. in diameter. Endoperidium sessile. Mouth definite, lighter color than the remainder of the endoperidium. This little species is unique in its nature, growing always on a dense, mycelial subiculum which spreads over sticks and logs. It is a native of warm countries and wide in its distribution. Originally described from French Guiana, I have it from Rev. J. Rick, Brazil, and have collected it in Samoa. There are specimens in the museums from Ceylon, Cuba, Paraguay, Australia, Bonin Island, China and Africa.

HISTORY.—The original illustration was somewhat inaccurate, showing a beaked mouth that the plant does not have, as is evidenced by the original specimens. Geaster lignicola (Linn. Jour, 18-386) and Geaster papyraceus (Proc. Am. Acad., 4-124) appear to me to be the same plant, though the latter does have a thinner exoperidium than the normal form. Geaster mirabilis was determined by Spegazzini and distributed by Balansa as Geaster saccatus. De Toni based on this misdetermination Geaster Spegazzinianus var. minor (Sacc. 7-87).

FORMS.—GEASTER SUBICULOSUS (Plate 100).—This is for me only a larger form of the plant. Excepting size, I can note no other difference. It was named from Australia, but reaches me also from India and Florida. The type form of Geaster mirabilis is globose when young, but I noticed in Samoa that they become oval in drying. They undoubtedly vary as to form, for one collection has reached Europe that was called "var. stipitatus." The large form (Geaster subiculosus) is inclined to the same elongated shape (see our plate).

GEASTER (SP.) (Figs. 147 and 148, the latter enlarged four times).—Is really a form of Geaster mirabilis, but the exoperidium is strongly *strigose*, and the only geaster known that has this character. As I have sent a photograph of the plant to Rev. Rick and advised him that it is unnamed, I presume it has before this been christened. It is, I think, the plant Rev. Rick lists as Geaster lignicola (Brot. 1906), but Geaster lignicola is only a synonym for Geaster mirabilis, and does not have this strigose exoperidium. (Note—In letter since received, Rev. Rick names it Geaster trichifer.)

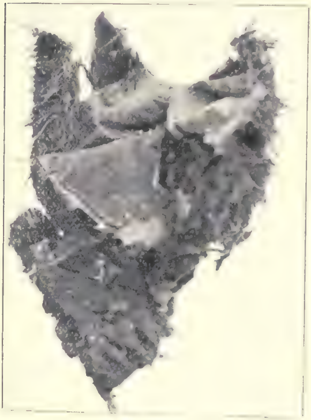

Fig. 148.

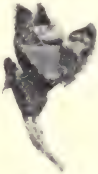

Fig 147.

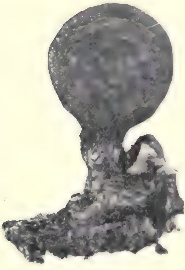

Fig. 149.

GEASTER STIPITATUS (Fig. 149).—While we have not seen the original specimens from Java, it appears to have been well illustrated. It is a large plant, 3 to 4 cm. high, and developed from a mycelial subiculum at the base. It differs from all other Geasters known in being decidedly stalked. Our figure (149) is from unopened specimens from Brazil that were called Geaster Juruensis. While there is a vast difference between Geaster stipitatus and Geaster mirabilis, it is only a difference of size and an intermediate form (Geaster subiculosus) is known. No doubt many connecting forms occur that are not known.

The following species of epigean geasters appear to me to be only forms of the same species. They all agree in the main characters. All are epigean, all are globose when young, all have sessile endoperidia, all have peculiar, velutinate exoperidia, all have strong, club-shaped columellae (rarely seen in any other geaster). They differ from each other chiefly in color, in degrees of development of the velutinate surfaces of the exoperidia, and one has an indefinite mouth.

GEASTER VELUTINUS (Plate 101).—Unexpanded plants, globose, sometimes slightly pointed at the apex. Mycelium basal. Exoperidium rigid, membranaceous, firm, light-colored (white when fresh). Surface with short, dense, appressed velumen. The outer and inner layers of the exoperidium are very much the same texture and thickness and usually separate partially (sometimes entirely) from each other in the mature plant. Endoperidium globose, sessile, with a definite, even mouth. Columella clavate.

Geaster velutinus is not a rare plant in the United States, growing over leaf mould in rich woods. The mycelium at the base is strongly developed (See Plate 100, Fig. 1), but it does not, I think, ever form a matted layer as in Geaster mirabilis. The expanded plants have a general, similar appearance to Geaster saccatus, but can be readily distinguished by observing the surface of the exoperidium.[5]

FORMS.—As previously stated, I can not but consider all the following as forms of the same plant. All have the same general nature, but differ among themselves chiefly in color and development of the velumen.

GEASTER WELWITSCHII (Plate 101).—As Geaster velutinus occurs in the temperate portions of the United States, it is a saccate species. The two layers of the exoperidium are more or less adherent, separating only partially and at the tips of the segments. When the plant extends to Florida it takes a more highly developed form. The inner (fibrillose) layer of the exoperidium separates and arches up over the outer (mycelial) layer, and the plant takes the form known as fornicate. Otherwise the plants are the same, and I have seen the fornicate and saccate forms in the same collection from Florida.

History.—This plant was first collected in Spain by Welwitsch, and this is the only collection known from Europe, the normal form (Geaster velutinus) never having been found in Europe. These specimens came into Berkeley's hands, who determined them as Geaster fimbriatus,[6] and sent a specimen to Montagne, who described it as Geaster Welwitschii. When the same fornicate form reached Berkeley from America, he called it Geaster radicans, under which name it appears in our Geaster pamphlet, page 31.

GEASTER CAESPITOSUS (Plate 100).—This for me is only a small, caespitose form of Geaster velutinus. I collected it originally near Cincinnati, and have received it but rarely from correspondents.

GEASTER JAVANICUS (Plate 101).—In temperate regions the plant is light-colored (Geaster velutinus), but it becomes dark in the tropics. Geaster javanicus is the same as Geaster velutinus excepting the dark color. It has the same fine velutinate surface to the exoperidium. The mouth is not so strongly definite, but on a dark endoperidium the contrast would not be so marked as on a light endoperidium.

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[5] Dr. Hollós in his recent book has the two species badly confused. Geaster velutinus is much better called a synonym for Geaster mirabilis than it is a synonym for Geaster saccatus.

[6] And Berkeley always determined the American saccate form (Geaster velutinus) as Geaster fimbriatus (Cfr. Myc. Notes, p. 155).

History.—The plant was named by Léveillé (Ann. Sci. Nat. 3-5-161), and the only known example of his naming is now in the herbarium of Professor Patouillard. We have received beautiful specimens from Rev. Rick, Brazil (see Plate 101, Fig. 5).

GEASTER SCLERODERMA (Plate 101).—This is a form of the black form with the velutinate surface so strongly developed it was well described as being warty. It is only known from some young specimens (see Plate 101, Fig. 6), and as it is well known that the cortex of all young specimens (Lycoperdons and others) is strong in contrast to that of more mature plants, it is probable that mature specimens of Geaster Scleroderma would not be so strongly marked.

RÉSUMÉ.—All the above-mentioned plants are, in our opinion, forms of virtually the same species. You can call it what you please, but we prefer to call it Geaster velutinus, which carries the leading idea common to them all.[7] The plant is widespread, especially in the tropics, and has received other names, viz: Geaster Lloydii, Geaster dubius, Geaster Dybowski, Geaster tonkensis. In addition, epigean Geasters in an unopened state, were not recognized as such by the early plant namers, and the following are all based on unopened, epigean Geasters, in my opinion all probably this same species: Lycoperdon tephrosporum, Lycoperdon Golungense, Lycoperdon tomentosum, Bovista velutinus, Cycloderma Ohiensis, Disciseda velutinus. The date dictionary man has, therefore, quite a job ahead of him.

RÉSUMÉ OF THE GEASTERS.

The literature of the Geasters is embarrassed with one hundred and twenty-seven names, all of them (except Geaster corollinum, which is pure jugglery) having been described as new species. I have seen and studied all the specimens in the principal museums of Europe and America, which embraces almost all the "type" specimens. In addition I have received from correspondents several times as many specimens as can be found in all the museums combined. I refer to forty-six names, all the specimens I have seen, and I would consider seventeen of these better designated as forms or varieties. While, of course, no man's opinion is final in these matters, and each man is entitled to his own opinion, I have been as liberal in considering species as possible, and have not refused to maintain any name, when I can note *any point of difference whatever,* on which to base it.

In the "species" of Geasters as in the "species" of all fungi the chief question is, "What is the difference?" In the end the new species work avails nothing unless it is based on some marked *point of difference*. Geasters, like all fungi, are in the main plants of *wide distribution*. Hence, a large portion of the work which is of a local nature is not of permanent value. But if the "type" specimens are preserved where they can be seen and studied it does no particular harm. It is easy to retain the good and put aside the bad. Of the Geasters that we know, and we have seen most of them (excepting those of Spegazzini which nobody knows) the following forty-six names are all that we feel should be preserved. Seventeen of these (marked with a star) present such slight differences that they are better called varieties or forms.

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[7] I presume a date dictionary expert might solve the question in another way.

TABLE OF THE SPECIES OF GEASTER.

SECTION RIGIDAE.

hygrometricus,
giganteus,*
simulans,
floriformis,
mammosus,
striatulus,
Drummondii,
ambiguus,

(All the following are non-rigidae):

ENDOPERIDIUM STIPITATE. MOUTH SULCATE.

pectinatus,
Bryantii,
asper,
Schmidelii,
plicatus,
Berkeleyi,
Smithii,

ENDOPERIDIUM SESSILE. MOUTH SULCATE.

Archeri,
elegans,
Hariotii,

FORNICATE SECTIONS.

fornicatus,
MacOwani,*
coronatus,
leptospermus.*

ENDOPERIDIUM STIPITATE. MOUTH EVEN.

limbatus,
Hieronymii,*
arenarius,
rufescens,
Readeri,*
minimus,
peruvianus,*
calceus.*

ENDOPERIDIUM SESSILE. MOUTH EVEN.

saccatus,
Englerianus,*
violaceus,*
triplex,
vittatus,*
fimbriatus,
infrequens.*

EPIGEAN SECTION.

mirabilis,
subiculosus,*
trichifer,*
velutinus,
caespitosus,*
Welwitschii,*
javanicus*
Scleroderma,*
stipitatus.

A GLOBOSE FORM OF LYCOPERDON GEMMATUM.

Mr. E. B. Sterling, Trenton, N. J., has at various times sent us some very interesting plants. He has a son at Dawson, Yukon, who has collected a number of "puff balls" for his father. Among these we find a globose form of Lycoperdon gemmatum, Fig. 150, and a number of the usual shape. Lycoperdon gemmatum is the most common species both in Europe and America, and it generally has a sterile base, well developed. That this species, which in the United States and Europe always has a stem-like base, should in the extreme north become globose with a very slight development of the sterile portion, is of interest as showing the influence that climate and conditions have on plants. This form has the same relation to the normal form of Lycoperdon gemmatum as the United States form Lycoperdon cepæforme has to the type form, Lycoperdon polymorphum of Europe.

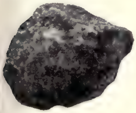

Fig. 150.

LYCOPERDON PIRIFORME IN TASMANIA.

Mr. George K. Hinsby, who resides on the west coast of Tasmania, is a very fortunate man, mycologically speaking. He resides in a section where *it is too wet* to gather fungi. He writes me that it rains so often that he rarely gets a chance to go to the "bush," and that the rainfall is from nine to twelve feet per annum. What a harvest of fungi there must be in such a locality. If it is ever our good fortune to go to Australasia we will direct our footsteps immediately to Mr. Hinsby's house. And his letter may have some influence in taking us some day, as we have on two occasions been within a few days' steamer ride of Australasia and refrained from going on, as our impression was that the greater part of the country was *too dry* to find fungi unless we happened to strike a rainy season.

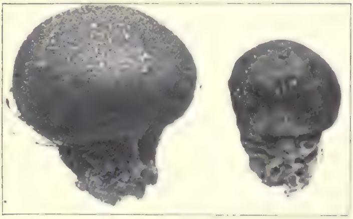
Fig. 151.

Mr. Hinsby sends Lycoperdon piriforme (Fig. 151), a subglobose form, the same as we have often collected at Cincinnati. There is one slight difference, the spores are smaller, averaging about 3 mic., and they rarely measure less than 4 mic. in specimens from Europe or America.

These are the first specimens we have ever seen of Lycoperdon piriforme from Australasia (Cfr. Lyc. of Aus., p. 32), but Mr. Hinsby writes me that he "found an acre of them and could have collected it by the bushel." It illustrates how little relatively is known of what species occur in Australasia. We hope Mr. Hinsby will not be backward in sharing with us some of the harvest of other species that must occur in such a favored locality.

BROOMEIA CONGREGATA.

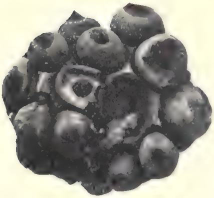
Fig. 152.

When we considered this plant on page 193, we expressed the hope that some one would favor us with a specimen for our museum. Our wish has at last been gratified. Dr. Kurt Dinter, of German S. W. Africa, has just sent us a small, but nice specimen (Fig. 152). Broomeia congregata is an exception to most puff balls. Its distribution is *relatively local*. It is known only from Southern Africa. Our best thanks are due to Dr. Dinter for this specimen.

THE MOUTH OF CATASTOMA ANOMALUM.

Having received from F. M. Reader, Australia, some fine specimens of Catastoma anomalum, we present a photograph (Fig 153, enlarged 3 times), to show the protruding mouth which no other species of Catastoma has. It also shows the *thin, brittle* exoperidium peculiar to this species. It might be said, and and truly said, that as the genus Catastoma (typically) has neither a protruding mouth nor a thin, brittle exoperidium, the plant could be made into a "new genus." While it could be done, it should not be done, in my opinion, for the plant naturally falls into the genus in every other character. It is an easy matter to make "new genera," and one can make a new genus for almost every species if he wants to. It is only another form of name-juggling, having just about the same merit as the jugglers who look up so-called synonyms in a date dictionary and shuffle the specific names about.

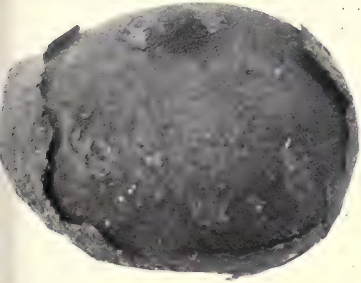

Fig. 153.

LYCOPERDON PSEUDOGEMMATUM.

This is one of the very few of Spegazzini's "new species" that are known in Europe because Balansa sold sets, and this is found in several of the museums. It is only a form of Lycoperdon gemmatum, not differing from the usual form more than dozens of others that occur in Europe and the United States. It has a constricted base and is grooved or wrinkled above as shown in our cut, Fig. 154. Lycoperdon gemmatum is at home in temperate regions. This form seems to me to be a poorly eveloped state, due to growing under climatic conditions not conenial to it. We have noted somewhat similar forms in *hard, clayey oil* in the United States.

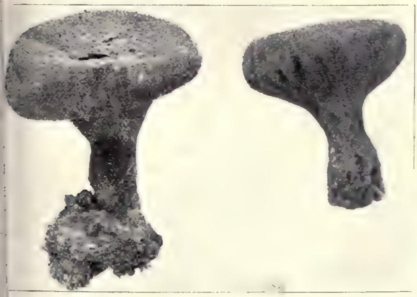

Fig. 154.

MYCETES ARGENTINENSES.

Carolo Spegazzini has kindly forwarded me a copy of his latest publication under the above title. It is entirely devoted to Gastromycetes, and therefore comes in the scope of my work and comment. I am most glad to see that it is well illustrated, and that some estimate can therefore be placed on the value of the species. Heretofore Spegazzini's work has been mostly vague, verbose descriptions from which no idea whatever can be gained as to the nature of the plants.

CYPELLOMYCES ARGENTINENSIS.—The first is a new genus which appears to me very good. Fig. 155 is a section of the plant, and fig. 156 represents a cluster of basidia. Spegazzini compares it to Xylopodium and Dyctiomycetibus. We do not know the latter (unless he means Dictyocephalus), but Xylopodium is obsolete. It has been proven to be co-generic if not co-specific with Phellorina. Spegazzini's new genus is very close to Phellorina, indeed it seems to be Phellorina *with a volva.* The basidial structure is also similar, for while it is hard for me to believe that any Gastromycetes has "chain-spores," it has been demonstrated by Patouillard that Phellorina has *clustered* basidia, very similar in general effect to the clusters shown in the figure. We have seen in Professor Underwood's collection a specimen collected in Texas by W. H. Long that seems to be exactly the same as Spegazzini's figure, except as to volva which may be absent by accident from this specimen.

PODAXON MACROSPORUS.—We do not pass judgment on descriptions of new species of Podaxon, except to state that we think there are about four times as many species now described as exist.

SCLERODERMA TUBEROIDEUM.—We are suspicious of Sclerodermas described as "subhypogeal," for all Sclerodermas are hypogeal when young, and if hypogeal when mature they are not Sclerodermas. The habits and description point strongly to unopened Geaster hygrometricus.

ARACHNION? FOETENS.—The doubtful mark is well placed. Arachnions are not subterranean, and their spore characters and gleba structure are quite different from Spegazzini's plant. It is probably a genus of the Hymenogasters.

DICTYOPHORA LILLOI.—The figure and description are exactly that of Phallus indusiatus, better known now as Dictyophora phalloidea. Excepting the size, which is slightly smaller than usual, the figure does not differ from the usual form in the slightest detail.

PHALLUS CAMPANULATUS.—Spegazzini's figure agrees fairly with Berkeley's, which was originally from South America.

MUTINUS ARGENTINUS (Fig. 157).—Spegazzini states that it differs in no manner from Mutinus Muelleri named by Professor Fischer, and he produces a diagram to show that 1887 is an earlier date than 1888. On referring to our calendar we find he is correct.

SIMBLUM SPHAEROCEPHALUM.—Spegazzini reports it "most common," which is in keeping with usual reports from South America. He also states that "Simblum australe, Speg." and also "Simblum Lorentzii, Speg." are "most distinct." (Prof. Fischer has been unkind enough to refer them as synonyms to Simblum sphaerocephalum.) If they are distinct, we feel that Spegazzini should publish a photograph and show it. Neither have been illustrated, and an unillustrated phalloid is really undescribed. If Spegazzini will send us photographs we shall be glad to publish them.

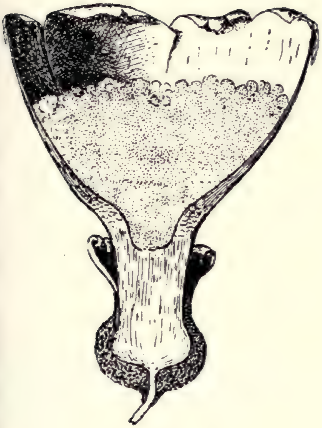
Fig. 155.

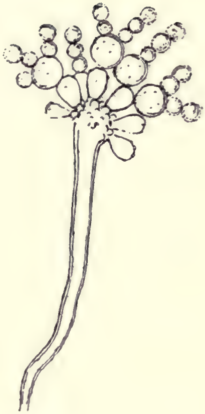
Fig. 156.

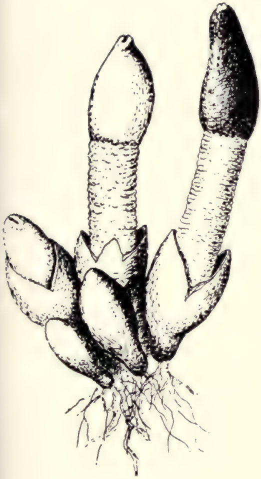
Fig. 157.

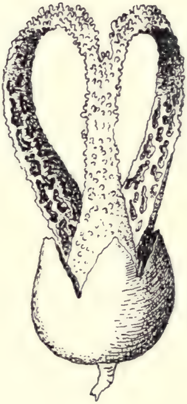
Fig. 158.

LATERNEA TRISCAPUS.—Under the name Clathrus triscapus Spegazzini presents a figure (158) that he refers to this species. If his figure is correct, and he has found a plant with the receptacle covered with papillate projections as shown (fig. 158), it is not Laternea triscapus but a new species, and even a new genus differing from Laternea as much as Blumenavia does. Professor McGinty proposes for it the name "Laternea Spegazzini, McGinty." We congratulate Spegazzini on the vast improvement of the present paper over what he has previously issued, and while his cuts are good, the best workers with the phalloids now (Möller and Penzig) use photographic reproductions, which are still better.

A FIELD OF PUFF BALLS.

We are enabled, through the kindness of W. A. Brewer, of Burlingame, California, to present a photograph of a field of puff balls. The species is evidently Calvatia gigantea, and how large they were we do not know, but they were certainly big or they would not be the prominent objects in a landscape photograph. These puff balls grew in a large circle, as shown in other photographs sent me by Mr. Brewer. We judge from the photographs that the circle is two or three hundred feet in diameter. When little agarics grow in circles they are often called "fairy-rings," but this puff ball circle was too large to be attributed to the fairies.

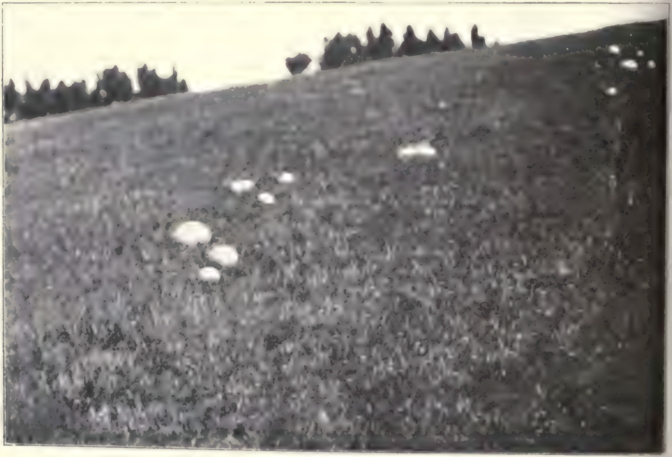

Fig 159.

A NEW HOST.—Professor McGinty writes me that he has just found Polyporus Polyporus growing on Sassafras Sassafras.

DÉCOUVERTE D'UNE RARETÉ MYCOLOGIQUE.

M. Victor Dupain a trouvé dans le cours de la présente année (1906) le rare Queletia mirabilis. Un exposé détaillé, en anglais, de 'histoire de ce Champignon a été donné à la page 185 des Mycological Notes. Comme en Europe, le Queletia n'a été vu qu'en France, un résumé en français de son histoire pourra intéresser les lecteurs français.

Il fut d'abord recueilli au Pont de Sochaux (Doubs?) par Perdrizet de Vaudoncourt, et communiqué à Quelet qui l'envoya à Friés, equel le décrivit et lui donna son nom.

Il fut recueilli depuis par A. Le Breton en 1884 à Saint Saèns (Seine-Inférieure) sous un gros tas de tan.

Il vient d'ètre trouvé par M. Dupain dans son jardin à la Mothe-Saint-Héray (Deux-Sèvres) et encore sur un tas de tan. C'est la troisième fois seulement que cette plante a été trouvée en France depuis quarante ans.

En dehors de la France, la plante n'a été recueillie que deux fois: une fois aux Etats-Unis sur de vieux tan, une autre fois en Angleterre à Kew, obtenue d'une façon adventive, de Spores envoyées des Etats-Unis.

Comme on le voit, presque toujours ce Champignon a été trouvé sur de vieux tan provenant de tanneries. J'incline à croire que ses Spores ont été apportées avec des peaux de l'Amérique du Sud, bien qu'il n'ait pas encore été signalé dans cette région. Les Champignons le la partie tempérée de l'Amérique du Sud sont encore très peu onnus. Beaucoup d'espèces "nouvelles" ont été décrites par Spegazini; mais comme les Champignons du monde entier— les Gastéromyètes du moins—sont relativement peu nombreux et doués d'une très arge dispersion géographique, il est probable que beaucoup des "nouelles espèces" de Spegazzini ne sont nouvelles que pour lui. Touteois rien de ce qu'il a décrit ne peut s'appliquer au Queletia mirabilis.

SOME "OLD SPECIES" FROM SOUTH AMERICA.

We have just received from Rev. L. Mille, Quito, Ecuador, three pecies which add to our knowledge of the distribution of puff balls.

BOVISTA NIGRESCENS.—This, a frequent species in Europe, *as never been collected in the United States,* notwithstanding the equent (false) records in American literature. It is replaced in ur country by Bovista pila. Its occurrence in South America is erefore of special interest, in view of its absence from the greater ortion of North America. I have, however, a specimen from Mexico.

CATASTOMA SUBTERRANEUM.— An abundant collection from Rev. Mille is exactly the same plant that grows in such great abundance in our western country. It is evidently a common species in South America. It was collected in Chile by Gaudichaud and determined and published by Montagne as Lycoperdon pusillum, afterwards described by Patouillard as Bovista argillacea. It was collected in Bolivia by Weddell and determined by Montagne as Bovista plumbea. It was brought from Patagonia by Darwin and called by Berkeley Bovista cervina. What name Spegazzini calls it I do not know, but he has undoubtedly discovered that it is a new species. I always feel like apologizing every time I use the specific name subterraneum as it is not subterranean, and it was the sixth specific name under which it was described. I am forced to use it, however, to avoid making a "new combination" (Cfr. Myc. Notes, p. 242).

LYCOPERDON WRIGHTII.—Rev. Mille sends us the same forms we have recorded from Africa (p. 271), with slightly rough spores. This species is now known from North and South America, Africa and Java, but has *never been collected in Europe*. We have also received a very similar (if not the same) species from British India.

NOTELETS.

REDISCOVERY OF MITREMYCES ORIRUBER.—Monsieur P. Hariot, the curator of the museum at Paris, has submitted to me some specimens collected by R. P. Farges at Tshen-Keon-Tin, China, which I find to be Mitremyces oriruber. This is the second collection known, the original from the Straits Settlement is at Kew. The species is known by the coarse, wart-like scales (cfr. Plate 69) and the *globose* spores. The Chinese form has spores about 12 mic. in diameter, which are smaller than in the type (15 to 17 mic.), but as the plants are otherwise exactly the same I do not feel like basing a new name on this spore variation. Mitremyces Ravenelii is also known from China.

MYCENASTRUM CORIUM.—J'ai commis une erreur (page 267) en annonçant la redécouverte du Mycenastrum Corium à Neuilly (France). C'est en réalité M. Rolland qui trouva la plante et non M. Patouillard qui était alors dans le Jura. C'est ce dernier qui m'avait annoncé cette découverte: n'étant pas aussi familier que je le voudrais avec la langue française parlée, je n'ai pas bien compris ses paroles et les ai inexactement rapportées.

Je profite de l'occasion pour annoncer que M. Ludwig a également trouvé le Mycenastrum Corium dans le Bois de Boulogne près de Paris.

MYCENASTRUM CORIUM AT WASHINGTON.—Fred J. Braendle has recently sent to the museum at Paris some specimens of Mycenastrum Corium from Washington, D. C. This species is quite common west of the Mississippi, but rare east. I think this is the fifth station east of the Mississippi that has come to my notice. It is a species that grows in many countries, Australia, Africa, Europe, South America, and has received names by local workers in most of these countries, but no man can find a character to distinguish one from another, and the species are all the same. Mr. Braendle sends it under the name Mycenastrum spinulosum, which is a local name for it in the United States.

MYCOLOGICAL NOTES

By C. G. LLOYD

No. 26

CINCINNATI, OHIO MAY, 1907

Concerning the Phalloids.

MUTINUS CANINUS (Plate 113).—This is the original form of Mutinus from Europe, but it occurs also in the Eastern States. It differs from the two American forms (considered in our previous paper) in having the gleba-bearing portion of the stem *short, contracted,* and formed of smaller cells than the remainder of the stipe. The gleba is a thick layer, definitely limited to this (upper) portion of the stem, so that it appears at first view as though the plant had a pileus as in the genus Phallus. Indeed, the old authors all included it in the genus Phallus until Fries took it out in 1849. The stipe of Mutinus caninus is slender, cylindrical, and nearly uniform in diameter. Its color as I have noted it in France is red, as shown in the recent picture of Monsieur Rolland. Fischer described it as white (with the upper portion red), and Hollos shows a plant with a white stipe. It probably varies in this regard. Mutinus caninus has been well illustrated in a number of old European works—Sowerby, Flora Danica (1259), and Curtis' London Flora. Also in the recent works of Hollos and Rolland.

GEOGRAPHICAL DISTRIBUTION—EUROPE.—It is the only species of Mutinus that occurs in Europe, and is widely spread. In France it is not uncommon.

UNITED STATES.—As far as known it is confined to the Eastern States, and Professor Burt reported it in his paper as common in Vermont. I have only received it from Professor James Fletcher, Ottawa, Canada. It is unknown, I think, from other countries or from the tropics, though the Phalloids of most foreign countries are very little known.

HISTORY.—Called by the old authors Phallus caninus, it was made the type of a new genus under the name Mutinus caninus by Fries. Sowerby called it Phallus inodorous, and claimed it different from other Phalloids in the absence of odor, a claim which I think has not been established. Mutinus Ravenelii and Mutinus brevis have been referred to the plant as synonyms, an error in my opinion.

CLATHRUS CANCELLATUS (Plates 92 and 112).—We considered this plant in our previous article, but at that time had seen no fresh specimens. We have received, through the kindness of Monsieur Auguste Bernin, Monaco, fresh specimens from which we are enabled to make a good photograph (Plate 112), the first photograph, we believe, that has ever been published. Clathrus cancellatus is to a degree not truly represented in Bulliard's figure and in the usual drawing. The section of the arm is not sub-cylindrical as shown by Bulliard, but flattened on the outer surface, and on the inner side the cells are larger and irregularly developed and torn. This is a structure somewhat similar to that on which the genus Blumenavia is based, and tends to throw doubt on the validity of the latter genus. The volva of Clathrus is not one uniform, gelatinous membrane, as is the volva of a Phallus. It is composed of a number of sections, corresponding in shape and size to the meshes of the enclosed young plant. These sections are united by thin, white plates of tissue that proceed from the arms of the enclosed plant. We think this structure will be well understood by referring to our sections on the plate. The structure has been illustrated and explained by Professor Fischer in technical language, but we believe our readers can get a clearer idea of it from our photographs. The photograph, Fig. 160 (which was crowded off our Plate 112), is an inner view of a specimen (the front half cut away), and was made to show the large, torn cells that compose the *inner* structure of the arms.

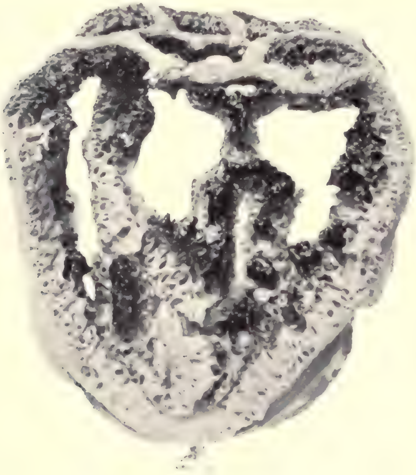

Fig. 160.

THE GENUS PHALLUS.—This genus is based on the well known and common Phallus impudicus of Europe. It is the type of the genus, and the genus has been taken as the type of the order from which it derives its name, as well as the common name "phalloid" applied to all these plants. It therefore seems to me useless, and certainly not in keeping with botanical usage, to try to abolish a name that has been so well established. It was Micheli in 1729 who proposed the genus and who has the rather doubtful honor of naming it, but he had a clear conception of it. When Linnaeus attempted to apply binomial names to the universe (not only to plants he knew, but to those he did not know), he made bad work of it, as he did with most fungi. He included Morchellas in the genus Phallus, plants that have no relation to Micheli's genus. The prestige that Linnaeus justly acquired through his knowledge of *flowering plants,* was reflected in the acceptance of his names for fungi (of which he knew very little), and it was many years before the errors introduced by Linnaeus in the nomenclature of mycology were eradicated.[1]

Professor Fischer divides the genus Phallus into two genera, Ithyphallus and Dictyophora, and the basis of the division is the presence or absence of a conspicuous veil. If the genus Phallus were a large genus, it might be a convenient division,[2] though in truth I think the only difference is in the degree of development of the veil, as all species probably have at least rudimentary veils. Ithyphallus is a generic name, recently proposed for Phallus impudicus, as it had always previously been known. The name Ithyphallus is based on the absence of veil (not entirely correct) and attributed to Fries (not at all correct).[3] Dictyophora is applied to that section of Phallus which has conspicuous veils.[4] As previously stated, we think all of the genus Phallus have veils, though variously developed. Phallus impudicus has a veil, rudimentary though very evident if it is sought for; Phallus Ravenelii has a veil hidden under the cup usually, sometimes protruding; others (Phallus indusiatus and Phallus duplicatus) have long, conspicuous veils.

PHALLUS IMPUDICUS (Plate 114).—This is the most common phalloid in Europe, and was the species originally known. It is widely distributed in Europe, and I have collected it abundantly in France.[5] I think it usually develops during the night, at least all the "eggs" I brought in so developed, and I never saw a partially developed plant in the woods. The stipe is pure white, hollow, composed of large cells. Within the volva at the base it is tapering, and is inserted in a little cup seated within the volva, which is shown in our Plate 114, Fig. 4. There is a rudimentary veil, fragments of which are seen adhering to the stipe on Figs. 1 and 2, Plate 114. The volva is white, and contains a little shallow cup or secondary volva as shown in our figure. The pileus is deeply reticulate, rugulose, as shown in

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[1] It would be well if modern "priorists" who show a disposition to dig up these ld errors and base their "new combinations" on them would bear in mind that riority is not always truth. Recently an American mycologist (I am sorry to say) roposed scores of "new combinations" and the only basis he had for his work was he fact that Linnaeus did not know enough mycology to tell a Tremella from a edar apple.

[2] The characters to form a genus are of course a matter of individual opinion nd largely a matter of convenience. A small genus like Phallus should show very arked and positive differences if it is divided, while a large genus, such as garicus, for instance, can be advantageously broken up on much less differences.

[3] The main discrepancy in attributing this name to Fries is the fact that he ever used it as a name for any plant. He called the genus Phallus and this pecies he called "P. impudicus" and "P" stands for Phallus. It is true he divided e genus into four tribes, one of which he called Ithyphallus, but that is no arrant for raising all these tribes to generic rank and sinking the original generic ame. In a large genus like Agaricus this may be advisable because the name has een applied to so many plants that it has lost all generic meaning, as these plants e now known. But that is not the case with Phallus. If modesty was the reason lvanced for changing the name, we might sympathize with the object at least, t we can see no improvement in that respect in adopting the name Ithyphallus.

[4] The first species known was Phallus indusiatus which is widely spread in opical countries. It was so named and well-figured by Ventenat in 1798. Desvaux nted up a lot of pictures that looked strange to him and proposed "new genera" them. He saw Ventenat's picture though he knew nothing of the plant and ve it an entirely new name Dictyophora phalloidea. Nees von Esenbeck eight ars later did very much the same thing, calling the genus Hymenophallus, but had enough consideration for the source of his information to use the specific me indusiatus. Those who subsequently wrote systematically on phalloids, Fries d Schlechtendal, used the name Hymenophallus (at least as a tribe) and it had come fairly established when Fischer dug up Desvaux's name Dictyophora. scher changed the current of usage, and the name Dictyophora is generally now ployed, and for that reason we would employ it if we felt there was any cessity for the genus.

[5] I have never seen any other phalloid so frequently as I found Phallus pudicus at Barbizon, France. It grew in light, sandy soil, usually in the woods und logs. Rarely a day passed that I did not either see or smell specimens.

Fig. 7, but when the plant first expands the depressions are filled evenly with the greenish gleba and appear smooth (as Fig. 1). At first the gleba is firm and almost odorless. At it deliquesces it becomes most excessively fetid, and the plant has a very unsavory reputation on that account. It is known to every French peasant under the name "Satyre," or "impudique."

HISTORY.—The plant was named Phallus impudicus in Linnaeus's Species Plantarum (1753), and has generally borne that name. Some of the old writers have called it Phallus vulgaris, volvatus, and foetidus. In recent works it is frequently designated "Ithyphallus impudicus (Linn.) Fries," but as previously stated we see no occasion for a "new genus," and if advertisements are employed they should be employed correctly, viz.: "Ithyphallus impudicus (Linn.) Fischer." An Old Dutch botanist, Hadrian, drew a bizarre figure of a phallus in 1564. It was either a very droll figure of Phallus impudicus, or a figure of a very droll anomaly of Phallus impudicus. This figure was copied in many of the old herbals of Europe, and Ventenat based on it the name of Phallus Hadriani, and Nees reproduced the figure and called it Hymenophallus Hadriani. Although I think no one else ever found such a droll anomaly, it was carried in European books for two hundred years, and we find the species given as late as Gillet (1787). Professor Fischer has the credit, I believe, of exposing this old fable. In England a form of Phallus impudicus was found that was said to have the odor of violets, and was called Phallus iosmos. It has been dropped from the latest English works, and there is a suspicion that it had its origin in somebody's defective olfactory nerves.

DISTRIBUTION—Europe.—Phallus impudicus is widely spread and very common over the most of Europe.

America.—I do not feel sure that the type form occurs in the United States. All the specimens I have seen belong to the next form, Phallus imperialis. The early records (Schweinitz) were almost surely based on Phallus Ravenelii. Some of the recent records of Phallus impudicus (Dr. Herbst's Flora, for instance) are probably based on Phallus duplicatus, which had accidentally lost its veil.

Japan.—Professor Fischer received a specimen from Japan, which he had doubtfully referred here.

Australia.—At Kew there is one specimen so referred, which was sent by F. M. Bailey, Queensland. Mr. Bailey has a note with it, that he never saw but a single specimen. It is decidedly more *yellowish* than the European plant, and has a broader, bell-shaped pileus. It appears to me very doubtful, and Professor Fischer has expressed the same opinion.

East Indies.—In Hooker's herbarium there is a very small and very doubtful specimen so named.

Java.—Ithyphallus costatus, as illustrated by Penzig, seems to me a form of Phallus impudicus. The reticulations of the pileus appear deeper and more winged, which is all the difference I can note. In Professor Fischer's key the difference is stated to be the absence of a rudimentary veil, but Penzig has no direct notes on this point, and Professor Fischer is evidently quite in doubt as to its distinctness from Phallus impudicus.

PHALLUS IMPERIALIS.—The chief difference between this plant and the previous is that Phallus imperialis has a pink volva and a smaller stature. Monsieur Boudier tells me he also notes a difference in habitat and in odor of the plants about Paris. Phallus imperialis is certainly only a form of

Phallus impudicus, and if it were not a *geographical* form it would hardly be worth noting. From the specimens I have received it seems to be the *only form* that occurs in the United States, and it is a rare form in Europe.

HISTORY.—When Schulzer found this plant in Hungary he noted the secondary volva at the base of the stipe, and as this was not then noted in Phallus impudicus he based on it a new genus and called the plant Kirchbaumia imperialis. It is surprising how much easier it is to discover a "new species" than a new fact about an old species. Kalchbrenner well illustrated the plant under the name Phallus imperialis. Somebody sent Professor Peck some specimens with accidental fragments of the volva adhering to the pileus, the same as often occurs in all phalloids. He erected on them a new genus, Cryptophallus albiceps.

GEOGRAPHICAL DISTRIBUTION.—It is a much rarer plant in Europe than the type form, Phallus impudicus. Professor Massee tells me, while the latter is common in England, he has never seen the pink form but once. In the United States it seems to be rare east of the Mississippi. Washington, D. C., is the only station surely known to me, specimens collected by F. J. Braendle. West of the Mississippi it is more common, and E. B. Sterling found it in great abundance about Denver. I have it also from W. H. Long, Jr., Texas, and L. G. Yates, Southern California. All these plants are the *pink form*, called for convenience Phallus imperialis to distinguish it from the typical white form, Phallus impudicus of Europe.

PHALLUS RAVENELII (Plate 115).—A common species of the genus Phallus, at least around Cincinnati, is Phallus Ravenelii. It usually grows in the woods, sometimes on old logs, but usually on the ground around logs. The stipe is white, cylindrical, hollow, and composed of large cells. The pileus is even or faintly reticulate, and by this character alone it can be known from the other native species of Phallus with white stipe.[6] Under the pileus there is a short, membranous veil as shown in our Plate 115, Fig. 3. It was overlooked, I think, by Schweinitz, who evidently referred the plant to Phallus impudicus. We have specimens from F. J. Fitzpatrick, Iowa, where the veil is longer and *protrudes below the pileus*, but I think this rarely, if ever, occurs in the form east of the Mississippi.

DISTRIBUTION.—It is spread over the United States from the Mississippi Valley eastward, but is more frequent in southern localities. It is unknown from the Pacific Coast or from foreign countries.

HISTORY.—Such a frequent plant must have come to Schweinitz's notice, and he referred it, I think, to Phallus impudicus. Ravenel was the first to closely note the plant and the peculiar short veil by which it is characterized, and he sent specimens and very complete notes to Curtis, who transmitted them to Berkeley. The latter named it Phallus Ravenelii, but he was so busy that he could not take time to consider the details, and his "description" tells nothing of the leading characters of the species. Professor Peck met the plant and, being unable to identify it from Berkeley's description, wrote to Ravenel, who sent his original notes, from which Peck had no trouble in recognizing his specimens. He published a complete description of it and a characteristic figure, and since the appearance of *Peck's* paper the plant has become generally known as "Phallus Ravenelii, *Berkeley*." If we believed in this system of advertising we would advocate the justice, in a case like this, of calling the plant "Phallus Ravenelii, Peck." Professor Fischer calls the plant Ithyphallus Ravenelii, and Professor Burt, Dictyophora Ravenelii, further proof to my mind of the inutility of both these generic names. Professor Patouillard is said to have named it Ithyphallus cucullatus.

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[6] We have an alcoholic specimen of another Phallus from Florida which is much smaller and has an even pileus but our data is so little we do not venture to name it.

PHALLUS RUBICUNDUS (Plate 116).—This is the *red* species of Phallus of our southern states. We are pleased, through the courtesy of W. H. Long, Jr., to give photographs of it, for it is a species very little known in recent works. That both Curtis and Ravenel were familiar with a Phallus *with a red stem* is evident from their notes and specimens, the latter now so old and discolored that little can be told about them. No veil is found *under the pileus* of this species as in the previous, but a fragment of the rudimentary veil shows in one of the photographs. The strong character of this plant is the *even* pileus and the *red stem*, and we suspect also that it has a *red pileus*. We have found no notes from any one who has observed the plant when fresh as to the color of the pileus, but the dried specimens that Mr. Long sent me (now several years old) has a decidedly *reddish cast*. Observations on this point are especially desired from those who have an opportunity to observe the fresh plant. Phallus rubicundus is known only to occur in our southern states, not as far north as Cincinnati. Ravenel and Curtis found it in North and South Carolina, and Mr. Long has recently collected it in Texas.

HISTORY.—Mention was first made of this species by Bosc[7] under the name Satyrus[8] rubicundus, from specimens that he collected in the Carolinas. Fries changed it to Phallus rubicundus, and Fischer to Ithyphallus rubicundus. It is to me a dubious question whether Phallus rubicundus is different from the plant Montagne called Phallus aurantiacus, which has a *red stem* and a *red pileus*, and which while originally from India, has been recorded from several *warm* countries. Mr. Long's specimens are mose obese, and I can not be sure that the pileus is red, as are specimens of Phallus aurantiacus I have from Hawaii. I have seen also a drawing of Phallus auranticus, made in Tonkin, from fresh specimens and submitted to me by Professor Patouillard. It is more *slender* and has a differently shaped pileus from the photograph of Mr. Long. I can not note much difference, however, as to form of the *type* specimens of Phallus aurantiacus and Mr. Long's photograph. It is certainly very close, and it is a suspicious fact that our *red Phallus* grows only in our southern states, and that the *red* species of other countries are only recorded from *warm* countries. Nor can I see any material difference in the description or figure of Phallus sanguineus, recently described as Ithyphallus sanguineus from Kamerun, Africa. As our "priorist" friends would state, however, whether they are the same or different, Phallus rubicundus is "prior."

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[7] Bosc made a trip through our southern states about the first of the last century. He published an article in French in a German periodical in 1811 concerning several fungi which he collected. He gave plates that were well enough made so that all of his phalloids can be readily recognized, and all now bear his names, viz., the following three species: Phallus duplicatus, Laternea columnata and Phallus rubicundus.

[8] It appears to me that the generic name Satyrus used by Bosc was purely a lapsus pennae. He called his first species by the common name "Satyre duplicati" (Satyre being a common French name for Phallus impudicus) and the Latin name he writes "Phallus duplicatus, Bosc." The second he calls "Satyre rubicund" and writes as the Latin name (inadvertently I think) Satyrus rubicundus instead of Phallus rubicundus. He gives no diagnosis of the genus "Satyrus" nor makes further mention of it.

PHALLUS IRPICINUS (Plate 116).—This is an exotic species, thus far only known from Java. It has a white stipe and a white veil, as has the related tropical species, Phallus indusiatus. The Javanese species differs, however, from all species with veils in the relative evenness of the pileus. The pileus is not smooth, however, as might be inferred from the photograph, but the surface is spongy, rugulose, and the gleba permeates the depressions. Indeed, the plant has been compared by the author to the genus Itajahya. Phallus irpicinus was described by Professor Patouillard under the name Dictyophora irpicina, and has been refound in Java and further illustrated by Penzig. We are under special obligations to Professor Patouillard for a photograph of the type specimen that is reproduced on our plate. We have a suspicion, however, that it is the same plant that Berkeley mentions under the name Dictyophora merulina, and of which he vaguely states "the reticulations are gill-like and the ochraceous head rivulose." The data, however, is not sufficiently clear to justify taking the name. Dr. Ch. Bernard, of Buitenzorg, writes me that Phallus irpicinus is one of the *common* species of Java.

PHALLUS DUPLICATUS (Plates 117 and 118).—We now come to a species that is the most striking phalloid of North America. The largest species we have, furnished with a beautiful, white, long veil, and most adominably fetid. It is a plant which once found will never be forgotten. It is a frequent plant at Cincinnati and widely distributed in the United States, but its exact distribution we do not know. It occurs in Florida, and it probably extends south to the tropics, merging into Phallus indusiatus. The pileus of Phallus duplicatus is strongly reticulate, but when the plant first expands the depressions are filled with the gleba and it appears even. The reticulations of the pileus are well shown in our Fig. 3, Plate 118, which was an old specimen, the gleba washed away by abundant rains. The most striking feature of the plant is the long, white veil which hangs from under the pileus. Unfortunately we have no large photographs showing perfect veils. In our photograph, Plate 117, Fig. 1, and that from Mr. Pleas, the veil is torn. In the United States there is no trouble in recognizing this species, as it is the only one with such a veil.

HISTORY.—This was one of Bosc's discoveries, and he gave a fairly good figure of it in 1811 under the name Phallus duplicatus. The veil in his figure is contracted (not open meshes), and it was probably made from an alcoholic specimen as was our similar photograph, Plate 118, Fig. 2. Professor Fischer includes our United States plant with the tropical species Phallus indusiatus under the name Dictyophora phalloidea. I am very familiar with our American plant and also (in Samoa) with the tropical species, and they seem to me quite different, though I do not doubt that they merge into each other and are really forms of one species. After the plant had become well known in the United States, some one sent Kalchbrenner (Hungary), as late as 1884, a specimen, which he immediately discovered was a new species, Hymenophallus togatus, and he gave a good figure of it. As soon as Kalchbrenner's paper appeared, Professor Farlow pointed out that it was the old, well-known species of the United States. Cragin found in Kansas a specimen with an unusually perfect veil. It, of course, became a new species, Phallus collaris. I think that most of the forms that occur in the United States are very similar, but Ravenel in his herbarium notes two forms, one with a veil but little longer than the pileus which he calls Phallus duplicatus, the other with the ordinary, long veil which he calls Phallus indusiatus (the name of the tropical species). Both have strongly reticulate pilei. I do not otherwise know the form with the *short* veil. Phallus daemonum, another name for a tropical species, has also been applied to our plant.

PHALLUS INDUSIATUS (Plate 119).—This is a very frequent Phallus that grows in many tropical countries, and which is very similar to the plant previously considered. They are undoubtedly forms of the same species, but the tropical form differs from the temperate form in the shape of the pileus, and more markedly in the nature of the veil. The pileus of Phallus indusiatus is more campanulate, broader, and not so strongly reticulate as Phallus duplicatus. The veil is more delicate, the threads more slender, and the meshes much larger. These differences are better appreciated by consulting our plates. As the plant grows in Samoa the veil is well shown in our Plate 119, Fig. 1. Alfred Möller figures a form (which we have reproduced, Plate 119, Fig. 2) which seems to us quite distinct in its *rigid* veil, but Professor Möller states that in Brazil the two forms merge into each other so frequently that it is not practicable to hold them as distinct. We are familiar with both Phallus duplicatus and Phallus indusiatus as they grow, and have found the characters of each constant in their respective countries. No description is needed for Phallus indusiatus other than our plate. The stipe is white, also the veil. In one form from Java (Phallus roseus) the veil is described as pink, and the same form occurs in French Guiana.

DISTRIBUTION.—A frequent plant in probably all tropical countries. No species is more abundantly represented in the museums of Europe. We have seen them from Australia, India, Andaman Island, Java, Ceylon, East Africa, Mauritius, Mexico, Brazil, British Guiana, French Guiana, South Africa, Surinam, New Caledonia, Cuba, Tonkin, Philippines, Borneo, Jamaica, and the list probably does not include one-half the countries where it occurs. There are some differences in these specimens, but we do not feel it practicable to distinguish under separate names until more is known about them. Some have spreading, bell-shaped veils, others the veil is more flaccid, cylindrical, and hanging. One from St. Vincent is much *smaller* than usual.

HISTORY.—This striking plant known to the French (not inappropriately) as "Phallus en chemise," being very common in the tropical countries, attracted the attention of many travelers during the last hundred years. Many specimens have been brought to Europe and placed in the hands of various mycologists, most of whom have discovered that it was a new species, and several that it was a new genus. Professor Fischer in his "Untersuchungen" (1890) records fourteen specific names applied to it (and this excludes those referring to the previous form).[9] Numerous changes have also been made by shuffling these names about under other "generic" names, Hymenophallus and Dictyphora, and the list of "synonyms" is truly formidable, and not worth repeating here. About a dozen figures of it have been published, many of them very good, but some evidently reconstructed from the descriptions of travelers, and quite amusing.[10]

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[9] We have hunted up all these old specimens at Paris and London (which are the basis of most of these names) and also all the old pictures. We fully agree with Professor Fischer that there is very little difference among them on which to base species. One, however, Phallus subacutus of Algeria, seems to us quite distinct. Also we believe that when the original Phallus daemonum is well known (if it is correctly figured as it appears) it will be held worthy of a separate name as a distinct form at least.

A similar plant was first illustrated by Rumphius in the Herbarium Amboinense in 1750 under the name Phallus daemonum.[11] This figure is referred to this species by Fischer, but to me does not appear to accord with the usual plant so widely spread in the tropics. Next it was called Phallus indusiatus by Ventenat (1798) from specimens sent by Père Vaillant from Dutch Guiana. Ventenat's figure is typical of the species, as I understand it; hence, I use this name. The next reference was by Desvaux, who saw Ventenat's picture, which looked strange to him, and he made it a "new genus" and gave it an entirely new name, Dictyophora phalloidea. He never saw a specimen in his life, and if he was justified in basing a genus on a picture, he surely was not in changing the specific name. Subsequent to Desvaux, there had been so much juggling and naming that it is not worth while to go into details.

PHALLOGASTER SACCATUS (Plate 120).—It is a disputed question whether Phallogaster saccatus is a phalloid or not. That is, it is disputed by some who do not know the fresh plant. I do not believe that any one who finds the plant will ever look for it anywhere excepting among the phalloids. It has the same greenish, fetid gleba that is associated with phalloids, the same spores and basidia, it deliquesces in the same way, and it seems to me that its relationships are entirely with the phalloids. It has no volva in the sense of ordinary phalloids, but it appears to me that the peridium might be considered as analogous to the volva, the central tissue as analogous to the receptacle, and thus the only difference from other phalloids would be that the receptacle deliquesces.[12]

Phallogaster saccatus is a rare plant in the United States.[13] When young it is pear shaped or club shaped, white with a smooth peridium, and I thought when I first saw it that it was a young Xylaria. As soon as I cut it open, however, its nature was evident, for I noted at once the phalloid-like gleba. The center is white and somewhat translucent tissue. In ripening this central tissue entirely deliquesces and disappears, the gleba deliquesces and adheres to the inside of the peridium as a fetid, mulcilaginous mass, and the peridium breaks irregularly as shown in our figure (Plate 120, Fig. 6), exposing the adherent gleba. We are much pleased to present in our plates photographs that will show the plant and its methods of dehiscence much better we think than the figures that have previously appeared.

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[10] Thus Gaudichaud published a droll figure with the veil on the outside of the pileus; Klotsch a curious affair with a large, bell-shaped veil attached to the middle of the stem.

[11] It is a question if Rumphius' figure is not a different species as considered by Berkeley. The pileus appears punctate rather than reticulate and the veil is much more finely meshed than the usual form. I should not be surprised if Rumphius' plant would yet be found to be quite distinct. I have a letter from my friend, Professor McGinty, who states that after an exhaustive study of Fischer's synonyms (with a date dictionary) he concludes that according to the "latest rules" the species should be called (and he proposes the name) "Dictyophora daemonum (Rumphius) McGinty."

[12] The plant has been placed with Hymenogasters, but a much simpler classification to my mind is based on the old definition which considers Hymenogasters as underground Gastromycetes, mostly with permanent gleba cells.

[13] I hunted the woods around Cincinnati, where it was originally discovered, for many years before I found it, and I have never collected it but twice, once on the ground by the side of an old log at Cincinnati, the other time on a log at Eglon, W. Va.

CLATHRUS TREUBII (Fig. 161).—Through the kindness of Dr. Ch. Bernard, Chief of the Biological Division of the Department of Agriculture of Java, we are enabled to present a photograph of this rare species of Java. It was described only last year (1906), and is evidently rare in Java, as it is not included in Penzig's excellent paper on the phalloids of this island. Clathrus Treubii was described as Clathrella Treubii, and while we feel that the genus Clathrella is not a good genus, this species would be a Clathrus on the disposition of the arms at the base, the distinction on which Clathrella was based. Clathrella Treubii is a red plant, very similar in general appearance to Clathrus cancellatus and very different in the structure of the arms. In Clathrus cancellatus the arms have a simple, cellular structure, and the inner cells are large and irregular. In Clathrus Treubii the arms are *tubular* and are wrinkled evenly on the inner surface. I think there is no other species of Clathrus known with these peculiar wrinkles as shown in Dr. Bernard's excellent photograph. At Kew I have seen a drawing of a Laternea (or a Pseudocolus) that was made in Java by Zollinger many years ago, the arms of which are wrinkled on the inner side as in this Clathrus. It was never published, and is not included in any of the recent works on the Java phalloids.

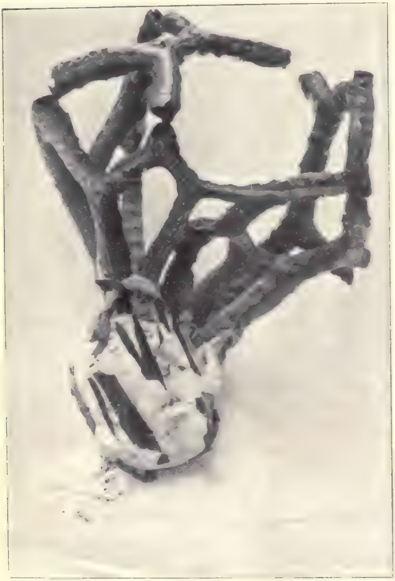

Fig. 161.

THE PHALLOIDS OF JAVA.—Dr. Ch. Bernard also favors us with a statement in detail of the phalloids that occur at Buitenzorg, Java. The phalloids of Java are mostly well known, owing to excellent work done by Monsieur Penzig a few years ago. Mutinus bambusinus, Phallus irpicinus, Phallus indusiatus, and Simblum gracile [14] are common throughout the season, though more abundant, of course, during the rainy season. Aseroe arachnoidea, Jansia elegans, Jansia rugosa, Phallus multicolor, and Clathrus Treubii are rarer species, and will probably be found only during the rainy season. In addition to these nine, Professor Ernst has described to Dr. Bernard a *very large phalloid* which he observed at Gedeh near Tjibodas. From Professor Ernst's description Dr. Bernard thinks it is probably the rare Aseroe Junghuhnii which was figured from Java by Schlechtendal some forty years ago and has never been recorded (with certainty) since. The kind of information that Dr. Bernard gives is a definite, practical addition to the knowledge of the phalloids, and we ask others *in foreign countries* who have a definite knowledge of their local phalloids to write us and favor us with similar information. The relative frequency or rarity of species is valuable information, and should be recorded. In most foreign countries (excepting Java and Brazil, owing to the fine work of Penzig and Möller) we question if the published works are such that a local student can arrive at an exact determination of the phalloids he finds. In all such instances we shall be glad to lend our aid and advice on receipt of photographs, dried specimens, and color notes.

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[14] Dr. Bernard lists this under the name of the Mauritis species Simblum periphragmoides, but from the specimens I have seen the Java form is so much more slender than the Mauritus specimen that at least until more is known of the Mauritus plant, I think it should be kept distinct as Berkeley considered it.

DEAD MAN'S FINGERS.—Mr. C. E. Pleas, Chipley, Fla., has sent me under the above name a fine photograph of Laternea columnata, which we reproduce herewith (Fig. 162). An account of the plant is given, Mycological Notes, page 298 and Plate 92. It is a frequent plant in Florida and the southern United States in general. Mr. Pleas also sends a fine photograph of Phallus duplicatus (under the name Phallus impudicus). Phallus duplicatus has a large veil, while Phallus impudicus has no evident veil. The splendid photographs that Mr. Pleas makes lead us to hope that he may find and photograph some of the rare and little known phalloids that occur in Florida.

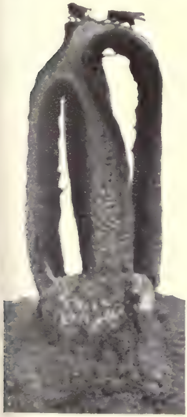
Fig. 162.

Speaking of Laternea columnata, we are reminded that it has just been discovered to be a "new species"—"Clathrus trilobatus," by N. A. Cobb, Hawaii. If Mr. Cobb were familiar with the forms that Laternea columnata takes, we might have been spared this synonym. Laternea columnata is a frequent plant in warmer portions of the American continent, both North and South America and the West Indies. Its record in Hawaii adds to our knowledge of its distribution, though it naturally could be expected to occur there.

MUTINUS XYLOGENUS (Fig. 163).—This has the unique distinction of being the very *smallest* phalloid known. Some idea of its diminutiveness can be obtained from our photograph, which is *enlarged six diameters.* It was collected by Leprieur, French Guiana, on rotten wood almost sixty years ago. Three single specimens, from one of which our photograph has been made, and a couple of little "eggs" are all the material that exists, and it is now preserved in the museum of Paris. Montagne, who describes it, states very clearly that it has a "free, conical, even, impervious receptacle" (pileus), and his figure plainly shows a pileus. If that is true, the plant belongs to the genus Phallus. Leprieur sent Montagne what seems to be a good drawing of the fresh plant. It appears to be a diminutive Phallus with a definite pileus, which Leprieur indicates as rugulose. Montagne placed it in the section "Mutinus," but from his remarks it is evident that he thought Mutinus has a pileus. Some years ago at Paris, Professor Fischer sectioned an egg and found the gleba borne directly on the upper portion of the stem, which makes it a Mutinus, as the genus is now defined. It differs from all others in having a capitate, globose mass of gleba. It is a great deal to hope, but we can not but express the hope, that some one in South America, Central America, or the West Indies, where this little plant probably occurs, will refind specimens and send us a few in a little vial of alcohol. It can certainly be known from our figure, not forgetting that the plant is only *one-sixth* as large.

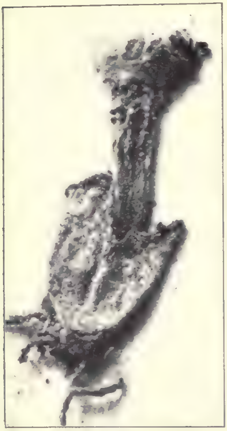

Fig. 163.

ITAJAHYA GALERICULATA (Plate 121).—We are glad to be able to present a photograph made from a fresh specimen, by Rev. Père A. Schupp, Pelotas, Brazil. It is one of the Brazilian phalloids that was illustrated in such a superb manner by Alfred Möller, and it is only known to grow in Brazil. Its uncouth name is taken from the river Itajahy of Brazil. The genus has a pileus as the genus Phallus, but a different structure. In Phallus the pileus is of a firm, uniform tissue, and bears the gleba on its *outer surface.* In Itajahya the pileus is of loose, lamellate structure, and the gleba covering these plates *permeates* the inner structure of the pileus. The photograph that Rev. Schupp sends has a general resemblance to a Phallus, and the small specimen is capped (probably accidentally) with a fragment of the volva. The structure of the pileus is better shown in the sectional photograph that was published by Alfred Möller, and we reproduce it also on our plate. Our thanks are especially extended to Rev. A. Schupp for the privilege of publishing his photograph.

BLUMENAVIA RHACODES (Plate 121).—We are under special obligations to Father J. Rick, Brazil, for a fine photograph that enables us to present a plate of this plant. It is a rare species, only known from Brazil. It was published by Alfred Möller in the superb manner in which he does all his work, so that it is something more than an unintelligible word "description." Blumenavia rhacodes, as will be noted from our plate, is very close to the genus Laternea. Indeed, the main difference is the wrinkled arms which are torn and lacerated on the inner side, and the plant might even be included in Laternea without doing much violence to classification. We have seen at Kew a drawing of a Laternea (or a Pseudocolus) from Java, which has arms strongly wrinkled on the inner side, and which shows evident transition toward the genus Blumenavia. Rev. Rick's photograph is much more slender than the photograph published by Alfred Möller, hence we reproduce Mr. Möller's original illustration, in order to give a better idea of the forms the plant takes.

The Development of Queletia.

The early stages of this rare plant have heretofore been entirely unknown. Last summer the plant was discovered by Monsieur Victor Dupain, Deux Sevres, France, growing on a pile of old tan bark in his garden. He very kindly mailed us some specimens, at various stages of growth, which have enabled us to observe the manner of growth of the stem. The genus Queletia has no volva. A section of a young specimen (Plate 122, Fig. 4) shows to the eye a homogeneous, white mass without any distinction as to stem or gleba, the same as a section of a young Lycoperdon. As the plant develops, the stem differentiates from the gleba portion at first *within* the peridium, and as the stem grows it breaks the peridium near the base, which remains as a collar at the summit of the stem. This will be readily understood by observing the two sections on Plate 122. Fig. 4 shows a very young plant without any distinction of stem and gleba. The next stage received by us is Fig. 6, in which the gleba had deliquesced and the spores ripened, while the stem had grown to about an inch and had just broken the peridium. What length of time is represented between these two stages we do not know, but probably not more than a day or two. It would be interesting to know if the gleba ripens *before* the stem begins to develop. None of the "eggs" that Monsieur Dupain sent us demonstrated this point. While we believe the young stages of Tylostoma have not been observed, they are most probably analogous to those of Queletia. It is quite contrary to what we think is the case in the genus Battarrea, where the peridium is borne on *top* of the stem, and both when young are contained in a common volva. The genera Queletia and Tylostoma have no true volva.

Additional Notes on the Lycoperdons of Europe.

Most of the work that we have done with Lycoperdons has been with dried specimens received from our correspondents. Last season at Barbizon, France, we made the personal acquaintance of some species growing that we had heretofore only known dried. Fresh Lycoperdons present characters that can not be learned from the dried specimens. We have always been under the impression that most Lycoperdons are white when young. At Barbizon we observed two species, Lycoperdon atropurpureum and Lycoperdon nigrescens, which have cortices that are *brown* even when very young.

LYCOPERDON GEMMATUM (Plate 46).—Our main reason for again noticing this common species is to present a photograph (Fig. 164) which we think represents the plant unusually well. Also a figure of the young cortex (enlarged four times) to show the peculiar nature of the consolidated warts which we hold is the essential character of Lycoperdon gemmatum. The warts of this species are very variable as to size, etc. (cfr. Myc. Notes, page 228), but the species can always be recognized, especially when young, by the *soldered* warts such as no other species has.

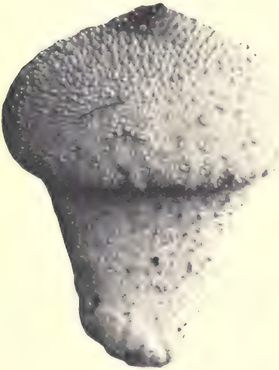

Fig. 164.

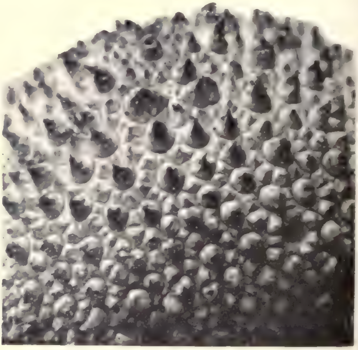

Fig. 165.

LYCOPERDON NIGRESCENS (Plates 47, 60 and 123).—We found this plant at Barbizon, France, but had previously collected it in Sweden. In both countries it seemed to us peculiar in its *habitat*. It does not grow in grassy fields or in rich, shady woods, but in open, dry, mossy places. The cortex of Lycoperdon nigrescens is *brown*, hence the name nigrescens which Persoon gave it is not so bad. The spines are connivent and fall away, leaving scars in the same manner as in Lycoperdon gemmatum, but these two species are not as close as we thought when we wrote our article on the Lycoperdons of Europe. Young plants are quite different, but it is not easy to distinguish the old specimens after the cortex has fallen. Although we have already given two plates of this species, we present another (No. 123), to better show the cortex characters.

LYCOPERDON ATROPURPUREUM (Plates 42, 57 and 123).—The plants we noted growing at Barbizon, and which when ripe we should have referred to Lycoperdon atropurpureum, have strongly developed spines, always *brown* when young. When mature these spines shrivel up and waste away, so that the mature plant (Plate 123, Fig. 5) would hardly be recognized as the same plant. We suspect that if the truth were known, more than one species has been confused (by us and others) under this name. If we could watch these various plants develop, quite good distinctions might be found in the color or other cortex characters which can not be ascertained from the dried specimens as they reach us. All have large, rough spores, and are very much the same when ripe. We present another plate (No. 123) in order to show the cortex characters of Lycoperdon atropurpureum at different periods.

A Scaly Form of Geaster Triplex.

Among some Geasters recently received from the Botanical Garden, Peradeniya, Ceylon, were some small specimens of Geaster triplex with a scaly exoperidium (Fig. 166). We have seen many specimens of Geaster triplex, for it is a frequent plant in many countries, but we never previously saw specimens with a scaly exoperidium. If this form is constant in Ceylon it is entitled to a name (Geaster squamosus) as a form, and it is fully as distinct as Geaster vittatus based on longitudinal fissures in the exoperidium of the same species. While the character of a scaly exoperidium is absolutely new in the Geaster family, to call it a "new species" would appear to me to be untrue. Any one who is familiar with Geaster triplex would consider it as a mere form.

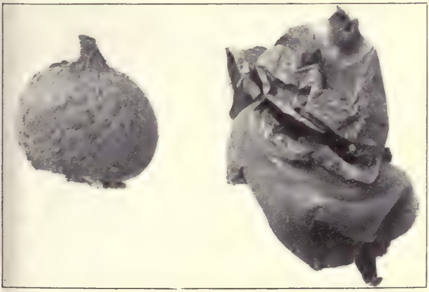
Fig. 166.

PIDGIN LATIN.

The recent botanical congress at Vienna, I am told, adopted a "rule" that in future all descriptions of new species which will be "recognized" must be in Latin.

We doubt if there are many mycologists, excepting perhaps those of the Catholic clergy, who have a thorough, familiar knowledge of Latin. It is close enough to the English so that most of us can take a Latin "diagnosis" and guess pretty well. But I think most mycologists can tell all they know about fungi and tell it much better in their own language than they can in Latin. We recognize the utility of writing a book like Saccardo, which is a compilation from all languages, in Latin, because then it becomes useful to all. But the editors of such publications must be qualified, as Saccardo is, to put other languages into Latin. Most any one with a boyhood memory of hic-haec-hoc can take an English-Latin lexicon and make out a form that will pass, but it seems to us unreasonable to ask one who has the use of good, vigorous English to emasculate his thoughts in bad Latin. If the next Botanical Congress wants to make a "law" that might do a little good, let them make a law that all "new species" must be satisfactorily illustrated. Good pictures are a universal language and tell the story, and tell it better than words of any language. In these days of excellent photographs and cheap photo-engraving processes, it is not too much to ask that those who seek "glory" of the "new species" variety, should at least be willing to go to the expense of illustrating their plant. If done as the result of a "law," it might be considered as a just penalty for the inflicting of "new species" on a suffering public.

Notelets.

THE GENUS NIDULA.—Two facts are strongly illustrated by this genus. First, the wide distribution of fungi; and second, how little is known as to the occurrence of "foreign" species. *Only four years ago* attention was first drawn to this genus by Miss White of New York. We have now several collections from Canada and northwest America, two from *Japan*, one from *Australia*, and have just received it from T. Petch, *Ceylon*. Truly it can be said as to "foreign fungi" what is known is only "a little bit off the top."

NIDULA MICROCARPA IN JAPAN.—This species, which seems to replace Crucibulum vulgare in our northwest section (Washington), has reached me recently from K. Miyabe, Japan. Crucibulum vulgare has a general resemblance to Nidula microcarpa. Crucibulum has been recorded in Japan by Mr. Tanaka. We have never seen it from Japan, but of course it may occur there, and it may be that Nidula has been confused with it.

CALVATIA.—Mr. Rea "can not agree with C. G. Lloyd's definition of the genus Calvatia, which he separates from Lycoperdon on the ground that the *peridium breaks up in its upper portion and has pedicellate spores.*" If that is my definition of the genus Calvatia I can not blame Mr. Rea, for I do not agree with that myself, and I do not believe I ever so stated.

A DOUBTFUL BENEFACTOR.—"You are a great benefactor to mycologists in clearing up name muddles and trying to stop the senseless practice of putting a mycologist's name at the end of each specific name. It is *vanity* that is the curse of the mycological literature of the present day. With all good wishes."—Extract from a letter from E. W. S. We question the "benefactor" part, for while we hold it would be a great benefit to stop many of the evils that result from the present system, we have no idea (and have never had) that anything can be accomplished excepting in our own publication. You can not stop bull fighting by appealing to the matadores.

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 27.

CINCINNATI, O. JULY, 1907.

CONCERNING THE POLYPOROIDS.

We have just begun a critical study of the polyporoids, but it will probably be several years before we shall do much publishing on the subject. The subject is so extensive, some twenty-eight hundred supposed species, that it will take considerable time before we can get any definite ideas as to the value of them. In the meantime we shall content ourselves with a few notes from time to time on the points that come to our attention in our investigations.

FOMES ROBURNEUS.—This is a very rare species I believe in Europe, and Bresadola states (Mycological Notes, p. 22): "There exists no original specimen of this in Fries' herbarium. According to his diagnosis, and certainly according to specimens of several authors, it is a variety of fomentarius. However, Fries' illustration (Ic. T. 184, f. 2) is an exact picture of the stratified form of roseus."

I was glad to find at Kew type specimens of Fomes roburneus from Fries. It belongs to the section Ganoderma and has no resemblance to fomentarius. I think Fries has given a good description of it in his Hymenomycetes, and his specimen accords well with the description. Also it is fairly well represented in his "Icones." I have received this rare plant from Rev. A. Breitung, Charlottenlund, Denmark, which agrees exactly with the Friesian type at Kew. When I was in Sweden, Mr. Romell called my attention to a Fomes growing on an oak tree at Drottningholm. If I remember correctly, he thought this was Fomes roburneus of Fries, though he told me the Friesian type specimen (he had seen the specimen at Kew) did not agree. I think the specimen at Kew is correctly named, and the Fomes we found at Drottningholm is something different, as yet I do not know what.

POLYPORUS BERKELEYI.—When Morgan wrote his account of the polyporoids he had Polyporus Berkeleyi correct, but what he should have called Polyporus frondosus he called Polyporus Anax.[1] It

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[1] If the labels were removed from the "type specimens" of the "foreign polyporoids" in the museums of Europe, I do not believe that any man could replace ten per cent of them correctly on the strength of the "descriptions" that have been printed of them. To express opinions of the identity of these plants based on these descriptions is only making trouble.

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is very difficult for any one in this country to decide as to the identity of Polyporus Anax from the "description," or any other Polyporus for that matter. From Morgan's work the impression has been gained in this country that Polyporus Anax is a synonym for Polyporus frondosus, and Mr. Murrill has recently published that "Polyporus Anax, Berk., Grev. 12, 1883, is apparently not specifically distinct from Polyporus frondosus."[2]

The type specimen of Polyporus Anax at Kew is a large, thick specimen that has no resemblance to Polyporus frondosus. Had Mr. Murrill looked at it he would have known at once that it is Polyporus Berkeleyi, and he probably did, but forgot it, in the mass of details that he attempted to learn as to ten thousand different specimens, of twenty-eight hundred alleged different species, in a dozen different museums, during a short vacation trip. Polyporus Anax is the manuscript name that Berkeley wrote on the specimen when he received it from Lea (No. 547). He sent it to Fries under the same number (547) and Fries described it (1851) and named it Polyporus Berkeleyi. It was undoubtedly the same collection, for Fries quotes the same number. Berkeley probably forgot it, for he lists the name, "Polyporus Anax, B.," in his Notices of North American Fungi (1872), though he had never described it under that name.[3] It was one of the species that was dug up from Berkeley's herbarium and published by Cooke after Berkeley had retired from the work.

POLYPORUS FRONDOSUS.—Mr. Murrill, in a recent number of the Journal of the New York Botanical Garden, gives an interesting note on Polyporus frondosus. He states that the Italian chestnuts are often attacked at the base of the trunk by this polyporoid and that it is thought to do considerable damage. The peasants are so fond of eating the fungus that they will not report its presence lest preventive measures be taken by the Government. Of more interest to me, however, than this item is the fact that he employs the name which everybody else uses, "Polyporus frondosus," less than two years since he published elaborate arguments to show that it should be called "Grifola frondosa (Dicks) S. F. Gray." Mr. Murrill is a good man and has a good knowledge of polyporoids, and I hope his contact with the mycologists of Europe has convinced him of the utter futility of attempting to force on the mycological world the absurd nomenclature that results from the system, adopted unfortunately by the institution with which he is connected. I meet a great many mycologists in my travels and I have never met, and I think Mr. Murrill has never met, a single man who takes any stock whatever in this system. I think Mr. Murrill has done good work, and a part of the most valuable work he has done, is that of demonstrating in a graphic manner the folly and inutility of this method of changing names, and showing the confusion that would result if any one else paid any attention to it. As he has apparently abandoned "Grifola frondosa," let us hope that he has abandoned them all, for he is too good a man to be hampered by such foolishness.

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[2] Of course he does not use the name "Polyporus" but invents a little, private designation of his own. We are quite willing to discuss the specific identity or differences of species, but we expect to employ a language that can be understood by our readers. For the benefit of the future when we quote from any of the modern authors who amuse themselves by shuffling around the names of the polyporoids, we shall translate their names into the usual mycological language.

[3] He had called it "Polyporus subgiganteus, n. s." when he received it from another collector.

NEW SPECIES.

The more specimens we receive from all portions of the world, the more strongly we become convinced that fungi are plants of wide distribution, and that the *fungus flora of the world is practically the same.* Dr. Kurt Dinter, from German Southwest Africa, has just sent us a fine collection of four species. Three of these, Geaster fornicatus, Geaster asper, and Geaster saccatus, are *absolutely the same* plants that grow in Europe and the United States. The other, Broomeia congregata, is well known, but only from Africa. Nine-tenths of the current literature of fungi consists of descriptions of supposed "new species" of fungi. A large part of it originates, I believe, only in the imagination, or inexperience, or lack of knowledge, or lack of opportunities of the authors. Thus, Geaster asper was fairly well illustrated by Micheli two hundred years ago. It was beautifully illustrated from England by Purton a hundred years ago, although to-day it will not be found included in any English list of Geasters. It grows fairly common around Paris, and has been brought into the museum several times since I have been here. What does it avail to "describe" it as a "new species" (Geaster campestris from the United States or Geaster pseudomammosus from Europe), when neither of the authors could take collections from the United States, Europe and South Africa and tell one from the other? There have been one hundred and twenty-seven Geasters described, and I have seen and studied practically all, and I can find but *forty-six* possible *differences* on which to base names. Seventeen of these are better called forms or varieties.

There is no use of railing about new species-making. There is no one but that has more or less of a touch of the fever. We are all more or less affected with the disease, not excepting the writer. It has been the curse of mycology since the beginning, and is getting worse and worse. It required eight volumes of Saccardo to record the accumulation of this matter during the first ninety years of the work. It required ten to include the additions during the last sixteen years. The appearance of Saccardo has been a great boon to new species-making. While no one can tell anything more about the plants now than he could before, he can at least hunt through the indices and make new names.

Dr. Hollós, who says some very good things (and does some very bad ones) writes on the subject of new species: "If Nature had spent her millions of years in experimenting, she probably could not have produced as many different species of fungi as have been scribbled together by mankind in one century. In the fourteen volumes of Saccardo's Sylloge Fungorum, 47,304 species are described. Thanks to the species manufacturing mania of his predecessors the true investigator is compelled to waste the greater part of his energy and time with the compilation of names of the same meaning, synonyms and superfluous, empty names." Since Dr. Hollós wrote the above, *only four years ago,* four volumes of Saccardo have appeared and 10,711 "new species" added, making the total 58,015, or probably 60,000 at the present writing. Who knows them all? Or who knows even a tenth part of them? Or who could ever be able to learn one-tenth part of them in a life-time? The subject of mycology is too large for any one man to master now in detail. From the very nature it must work into the hands of special students of special families, and I believe only by this means can anything permanent be accomplished. I do not condemn new species simply because they are claimed to be new. I have seen in the Gastromycetes a great many that I have condemned because I did not find them new, but I have found many that appear to me to be well founded. Notwithstanding the "sixty thousand" there are a great many new ones yet to be named. Not in Europe I believe, nor to a much greater extent in America, but in that vast region known vaguely as "foreign lands," where all that has been done with mycology is but a small beginning. Any one who secures extensive material from these "foreign lands" and attempts to monograph it after he has learned as far as possible all that is known on the special subject, will be embarrassed with the forms he finds for which he has no names. By far the greater part of foreign material consists of species widely distributed and common in Europe and America, but a large part of the species of these foreign lands that are in any degree local are as yet unknown. If these foreign lands are worked in future as at present, Saccardo's "sixty thousand" names will be swollen to one hundred and sixty thousand before he is through with it. There is no way of even guessing approximately the number of species that exist that are good. If I were to guess on the Gastromycetes, basing my guess on what I have learned in the six or seven years I have worked on this one subject I should guess about five hundred. Over a thousand are included in Saccardo now, but I think about one out of three is "good," and that there are enough additional not known to make up the half. On this basis there would be about 30,000 fungi if all were correctly known.

NEW GENERA.—I note in a recent pamphlet that some more "new genera" have been discovered. "Derminus" for Crepidotus, Galera and Hebeloma. Agaricus for the white-spored species. "Hyporhodius" for Pluteus, Claudopus, etc. I wonder whose pipe dream these are. Smoke up. The number of "new genera" you can discover by this system of juggling is only limited by your ability to invent new names.

NOTES OF TRAVEL. LEIDEN.

A second visit to Leiden was made chiefly to buy some of the rare works of Persoon that were offered at auction in the sale of Oudeman's library. It is probable that Persoon as he tramped over Germany and France hunting fungi never imagined that the day would ever come when one would travel half across Europe for the opportunity to buy a few of his books; or that any one would pay two or three pounds for some of his pamphlets that originally sold for a few francs.

I found much more life and energy in the Botanical Museum at Leiden than on my previous visit. There is a new director now, Mr. J. P. Lotsy, who has succeeded in instilling some new life. On my previous visit, while the specimens on sheets in Persoon's herbarium were in good condition, the specimens in boxes were in bad shape and it was not practicable to work with them. All has now been changed, due to careful work on the part of Dr. W. J. Jongmans who has charge of Persoon's herbarium. The specimens have all been poisoned and each placed in a glass covered box. It is evident that they are beginning to appreciate at Leiden the historic value of Persoon's herbarium. I had not seen these boxes before and they throw some additional light on the puff ball history.

NOTES ON PERSOON'S HERBARIUM.

LYCOPERDON CRUCIATUM.—It has been supposed that Persoon illustrated this plant under the name Lycoperdon candidum. I think this is probably true though the figure is not certain and there are no specimens so labeled in his herbarium. That he did not have a comprehensive knowledge of the species is however evident as I found some characteristic though depressed specimens labeled by Persoon, Lycoperdon depressum. He never published it under that name.

LYCOPERDON MOLLE.—Additional specimens in boxes confirm our account of this plant as given in footnote, p. 209. A correct idea of Lycoperdon molle according to Persoon's views is our figure 4, Plate 42.

CALVATIA SACCATA.—Specimens are labeled by Persoon, "Lycoperdon excipuliforme, Schaeff." If modern botanists would use this there would not be the same objection to it there is when they write "Lycoperdon excipuliforme, Scop." Schaeffer did not propose the name and Scopoli did not indicate this plant under the name, so I think it is erroneous to use it in the sense of either of these authors.

SCLERODERMA AURANTIUM.—There are several collections of this common species. Some are labeled "Lycoperdon aurantiacum, Bull., Scleroderma citrinum, Pers. Syn." thus proving that Persoon considered his species citrinum a synonym for Bulliard's figure. He kept them distinct in his Synopsis but the specimens were probably labeled afterwards.

A NEW GALERA.—Galera kellermani is the latest from America. It has the advantage over most in being well illustrated. It was probably named for doctor w. a. kellerman.

A LEARNED INDIVIDUAL.

If you read French you will probably be amused as I was when I ran across the following title page in purchasing books in Paris. I had not the pleasure of an acquaintance with Dr. Hussenot, but judging from the number of "learned" Societies of which he was *not* a member, he seems to have been a pretty smart fellow.

Chardons Nauceiens,
ou
Prodrome
d'un
Catalogue des Plantes
de la Lorraine.
1er fascicule
Par le Docteur Hussenot.
Qui n'est rien ; pas même medicin ; membre d'aucune acad.;
corresp. d'aucune soc. savante ; qui n'est ni de la soc.
royale des sciences, lettres et art de Nancy ; ni de
la soc. cent. d'agricult. de la même ville ; pas
plus de la soc. d'emulation des Vosges que de
celle philomathique de Verdun, ou d'aucune
de celles de Metz: directeur d'aucun jardin
public ou particulier; conservateur
d'aucune collection, autre que la
sienne, qui se mange des bêtes ;
redacteur de rien du tout; enfin,
simple citoyen comme
tout le monde hors qu'il
n'est pas décoré.

NOMENCLATURE.

The following letter is from one of the leading mycologists of the United States, but I do not give his name as I do not wish to draw him into a discussion of the subject:

"Please accept my thanks for yours of the 15th instant naming the Calvatia sent you, and also for another of your printed letters, this time No. 10. I am not sure that you can introduce a system of nomenclature that will gain general adoption, but I do believe there is a great deal of sense in what you say concerning this subject. The attempt to make priority the decisive thing in regard to the selection of names can never work well in regard to the names of fungi, whatever we may say of the method as applied to the nomenclature of flowering plants. I am sure, too, you pursue the correct method in trying to determine what the names of European origin mean.

"I hope you will find sufficient encouragement to warrant you in devoting your time and opportunities to the matter. We are all interested in your success."

I am not trying to "introduce a system of nomenclature that will gain general adoption." I quit indulging in day dreams years ago. I am only trying to show the advantage of using the names that are of *value from historical truth and from general use*. And I believe, if mycological writers in general would rely on these principles alone in the selection of names, it would only be a short time until we should be in practical accord. There is an "if" in that sentence, however, that has a great deal of bearing on it. Before we can hope to have authors adopt names solely on their merits, the personal advertisements must be eliminated. That will never be done. There are too many men whose interest in mycology is chiefly that of getting up "new combinations" or "new names," with this main object in view. They will never consent to have the "reward of their labor" taken away. And as long as it is so easy to shuffle names about and obtain this "reward" it will be done.

CALVATIA RUBROFLAVA IN BRAZIL.

Rev. J. Rick writes me that the species is "here common and grows in sandy places *everywhere*." Is it not strange that this plant known heretofore only from the United States and rare there so far as known (excepting in one locality, Lafayette, Ind.), should prove a common species in Brazil? When the science of mycology gets past its babyhood, and mycological observers turn their attention from the hunt for "new species" to the study and distribution of the old, then we can expect some interesting developments. We are well convinced that the "puff balls" of the world are largely the same species and that the number of species is relatively few. But their distribution presents some curious surprises. Witness the case of Arachnion album fairly common in the United States and known in Europe from only one collection (Italy). Or Bovistella Ohiensis, a most abundant plant in our Southern States and known in Europe from one collection each from Germany and Spain. Or Mitremyces Ravenelii of our Appalachian regions which proves to be a *common species* in Japan. Or, Lycoperdon Wrightii which occurs in North and South America, Java and Africa but has never been found in Europe. Truly we are just beginning the real study of mycology.

LASIOSPHAERA FENZLII IN SUMATRA.—In the museum at Leiden I saw a large specimen of this plant, collected in Sumatra. It was over a foot in diameter and all trace of peridium had fallen away. We think that our account of this plant (Myc. Notes, p. 191) and its habits is entirely correct. It is the "giant puff ball" of India and the East Indies and seems there to replace Calvatia gigantea of the remainder of the world.

MYCOLOGICAL "LITERATURE."—Much of the mycological "literature" nowadays reminds me of one of the patent carpet sweepers that sweeps up the trash and carries it along with it. Thus, sixty years ago, Tulasne wrote a monograph of the Nidulariaceae. He hunted up all the old references and pictures, reduced them to synonymy and listed them in detail. For the three common species he gives sixty-one references, which was information at that time, as it was original work. In 1902 Miss White, New York, writes again on the Nidulariaceae, and gives with the same detail forty-one references, thirty-six of them being copied with a few changes from Tulasne. In 1904 Dr. Hollós writes on the Nidulariaceae, and we find the same old list served up with a little rearrangement, and a few additions, but practically the same thing. The whole list is rubbish, and should have been dropped (in detail) after Tulasne had shown it up.

CAPITALIZING SPECIFIC NAMES.—As we note that the Journal of Mycology is printing personal specific names in lower case type, we suppose there is some new "rule" on the subject. The editor is a great stickler for "rules." We think it is really a good rule, for personal names are without doubt used too much for plant names, and seeing their names in lower case type ought to take some of the conceit out of the system. In our own case if we ever experienced any secret pleasure in seeing "Hypocrea Lloydii" in type, it was more than counterbalanced by the disgust we felt when we saw it printed as "Hypocrea lloydii"

REPUBLICATION OF NOS. 1. 2, 3 AND 4 MYCOLOGICAL NOTES.—In order to supply the frequent demand we have republished the first four numbers. They will be mailed to any one on application to the Lloyd Library, Cincinnati, Ohio.

We are now in position to complete most of the sets of our publication, with the exception of The Volvae and Mycological Notes Nos. 12, 13 and 14 and 19, the latter having recently become exhausted.

BOUDIER'S PLATES.

The following extract is from a letter from Prof. Geo. F. Atkinson. It is in keeping with our feeling that Boudier's are the most perfect plates that have been ever issued.

"I presume you know that the Library at Cornell at my instigation has been from the first a subscriber to Boudier's Plates for a complete set. When I was in Paris in 1903 I spent half a day looking through Boudier's original illustrations with him. I recognized in them at that time the finest illustrations of this character which I had ever seen. Added to Mr. Boudier's talent as an artist, we have the work of a very careful scientific man in connection with accurate mechanical work in measuring and obtaining the exact proportions of the different parts of the plant. At that time he told me his method was to obtain absolute accuracy of form and proportions. I regard them as the finest set of Mycological plates which have ever been published."

I also have a letter from Professor Peck on the same subject.

"Boudier's plates seem to me to be about as near perfection as we can hope to get at present. Only a single weak point has suggested itself to me and that is in the failure to show the color of the young gills in the few species of Cortinarius figured. I suspect that you yourself, who have so valiantly championed photographic illustrations of fungi, will acknowledge that these figures are better than photographs."

I have no hesitation whatever in stating that such plates as Boudier has issued are vastly superior to any photographs that could be produced. If the quality of mycological plates was up to the standard of Boudier no criticism could be offered as to this method of illustration. Unfortunately, however, the great majority of plates of agarics that have been issued are so poor that they do not at all represent the plants. And all that I maintain about photographic illustrations is that a good photograph is vastly superior to a poor drawing, and that a large part of the colored plates are very poor.

Professor Morgan writes:

"These plates are the ideal of perfection. They are models for work in illustration both artistic and scientific."

Professor H. C. Beardslee writes:

"Boudier's plates are certainly fine, and it makes one feel that good work is really worth while. I felt more like careful work after I had looked over them."

Professor W. A. Kellerman writes:

"I had thought you praised Boudier's plates too highly, but I see now you did not commit any extravagance."

The library or individual who is interested in this line of work and who can afford it, and does not subscribe for Boudier's plates as they are issued is making a mistake. But a few years will pass I think until these plates will become as rare and as high priced in the book market as Sibthorp's "Flora of Greece."

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 28.

CINCINNATI, O. OCTOBER, 1907.

CONCERNING THE PHALLOIDS.

MUTINUS ELEGANS.—In reply to my article as to the identity of, or distinction between Mutinus elegans and Mutinus Ravenelii, I have received two opinions on the subject. Professor Morgan writes that he finds Mutinus Ravenelii, and that he does not consider it as a small form of Mutinus elegans, though it is not always club-shaped. Mr. M. E. Hard, of Chillicothe, Ohio, sends me a photograph[1] (Fig. 167) which to my mind would strongly indicate that they are both the same plant. It will be noted that Mr. Hard's photograph presents

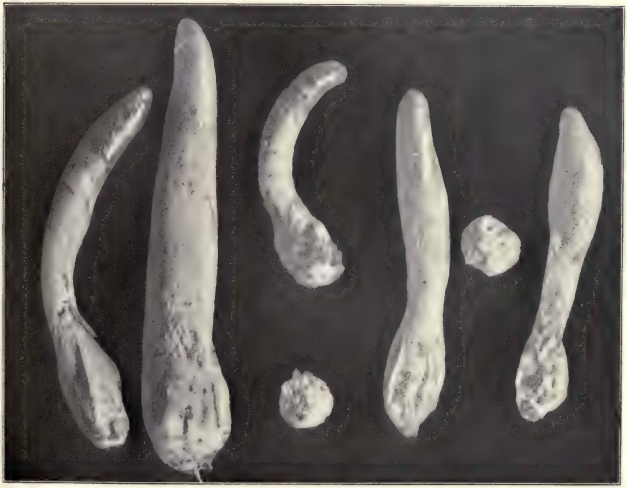

Fig 167

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[1] This photograph has been published in Kellerman's Bulletin as Mutinus caninus, an obvious error (cfr. Myc. Notes, p. 325, pl. 113.)

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both shapes. I had supposed that the variance in shape constituted the difference between these species. If they are not distinguished by these forms, I do not think it will be practicable to distinguish them. Mr. Hard's plants are smaller than usual, but it is very difficult to maintain a species on a question of size.

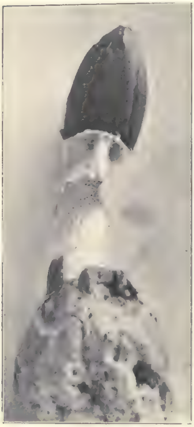

Fig. 168.

PHALLUS RAVENELII,—*A form with a long veil.* Mr. M. E. Hard, Chillicothe, sent me a photograph (Fig. 168) of a phalloid which I consider only a form of Phallus Ravenelii with a long veil. Several years ago I received exactly this same plant from F. J. Fitzpatrick, Iowa, and sent specimens to Professor A. E. Burt, who had then recently written a paper on the American phalloids. It was his opinion then, as it is mine now, that it should be referred to Phallus Ravenelii. Usually this species has a short veil hidden under the pileus, and for that reason a "new species" might be based on Mr. Hard's plant. I am afraid, however, that like many of the "new species" proposed, it would in time become very embarrassing for the author. The relative length of the veils of phalloids is a varying factor, and while this seems to be an extreme variation, I do not question that when our phalloids are observed that we shall find all degrees of connecting lengths. Except as to the length of the veil, Mr. Hard's photograph represents Phallus Ravenelii exactly. There would be no objection to a separate name to indicate this long-veiled form, but we should prefer that some one else would propose it.

LYSURUS BOREALIS (Fig. 169).—This plant was introduced into American mycology under the name Anthurus borealis, the genus Anthurus being considered in the sense as found in Fischer's recent works. I am convinced from the investigations that I have made that this is an entire perversion of the correct meaning of the genus, and that our American plant does not belong to the genus Anthurus in the sense of the author of the genus. It was Kalchbrenner who proposed the genus Anthurus. He represented his plant as having a *tubular, flaring* stem, (see fig. 170) ; the limb of the tube divided into lobes. It can well be compared to the corolla of a monopetalous flower, such as the corolla of a tobacco plant. I am aware that Kalchbrenner was a very uncertain authority, and moreover I have never seen a phalloid belonging to the genus Anthurus in the sense of Kalchbrenner. But I do not believe it is correct to take his genus in an opposite sense unless it can be proven that no plants exist like Kalchbrenner's figure.[2]

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[2] For note 2 see page 352.

Fig. 169.

LYSURUS BOREALIS.

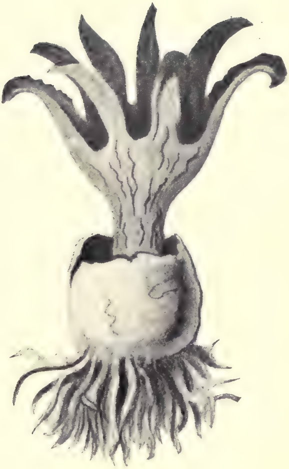

Fig 170.

ANTHURUS MÜLLERIANUS.

Showing the distinction that should be drawn between the genera Lysurus and Anthurus.

If we take our idea of the genus Lysurus from the original species, it has a *columnal stem* constricted at the top, and bearing at the summit, free, spreading, pointed, tubular arms. It is an idea essentially different from that of the genus Anthurus in the sense of Kalchbrenner.[3] A comparison of the figure which is supposed to represent the original Anthurus, and of our American plant (fig. 169) will I think show that they should be classed in different genera.

Alcoholic specimens of the eggs of the original species of Lysurus were sent to Patouillard and he found the gleba was borne on the outer surface of the arms, and from this one fact he evolved a theory of classification of the phalloids, the primary division being those with the gleba "internal" or "external." Fischer, in Saccardo (vol. 7) and in his early work, draws the distinction between Anthurus and Lysurus on the lines of the authors of the original genera. When Patouillard's paper appeared, Fischer changed his definition and distinguished "Lysurus from Anthurus by the former having the inner faces of its arms smooth and not covered by the gleba, while they are so covered in Anthurus." I think it would have been better to have left it as it was originally, for it was a very plain and easy distinction between the genera, and according to the modern definition I do not believe that any one can tell to what genus most of the museum specimens belong. They seem, as does Burt's sectional drawing, to have the gleba pretty well *surrounding* the arms. We therefore believe that our American plant should be placed in the genus Lysurus according to the original, and in our opinion, the only practical distinction between these two genera.[4]

I have a very interesting note from Professor H. C. Beardslee in regard to the occurrence of Lysurus borealis at Cleveland.

> "The first time I saw it, it was sent to Cass School by a gardener from the west side of the city, where it had appeared in some abundance on a pile of rotting sod, and was sent to Professor Comstock for identification. The same year a second collection was made also on rotting sod. This was the last appearance for three years when I again found it in Cleveland, this time coming from the public schools, where it was brought by a boy who was a member of the botany class. He reported that it grew in a neighboring garden and that he gathered more than one hundred plants. I again discovered it when I was visiting my brother in Cleveland for a day or two. He reported that a

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[2] The original drawing from Perrottet, India, that was sent to Montagne and on which the genus Calathiscus was based, is an Anthurus in the sense of Kalchbrenner. The figure that represents the genus Calathiscus appears to have been purely an imaginary production with no resemblance whatever to Perrottet's sketch. We expect to explain the matter in full some day, and at present only refer to it incidentally to show that there is collateral proof of a genus Anthurus in the sense of Kalchbrenner. We hope however that Professor McGinty will not run across this item, for if he does he will undoubtedly transfer all the species of the genus Anthurus to the genus Calathiscus, in keeping with the "rules."

[3] And reference to Kalchbrenner's description of Anthurus (Grev. 9, p. 2) shows that it was this distinction that he had in mind when he proposed the genus, and he expresses it very plainly.

[4] We also believe from our comparative study of dried specimens of Lysurus Gardneri of Ceylon, Lysurus Australiensis of Australia and Lysurus borealis of America that they are all one and the same species. We are not now in position to prove it, however, and shall employ these local names until (or unless) we can procure further evidence. Photographs of the fresh plants of Ceylon and Australia would soon settle the question.

strange plant had appeared in their tomato bed, which was clearly Lysurus (Anthurus) borealis again. Later it appeared in profusion. Sometimes there were a dozen plants. The tomato bed had been filled the fall before with prepared soil, which the man who furnished it said was made up of rotted sod. I suspect that it also contained street sweepings, but of that I could not be certain. As you have asked in Mycological Notes for information as to the occurrence of this phalloid, I am giving you these details."

PHALLUS AURANTIACUS (Fig. 171).—The most interesting paper I have recently seen on this phalloid is by N. A. Cobb, of Hawaii, on the "Fungus Maladies of the Sugar Cane." Mr. Cobb has dis-

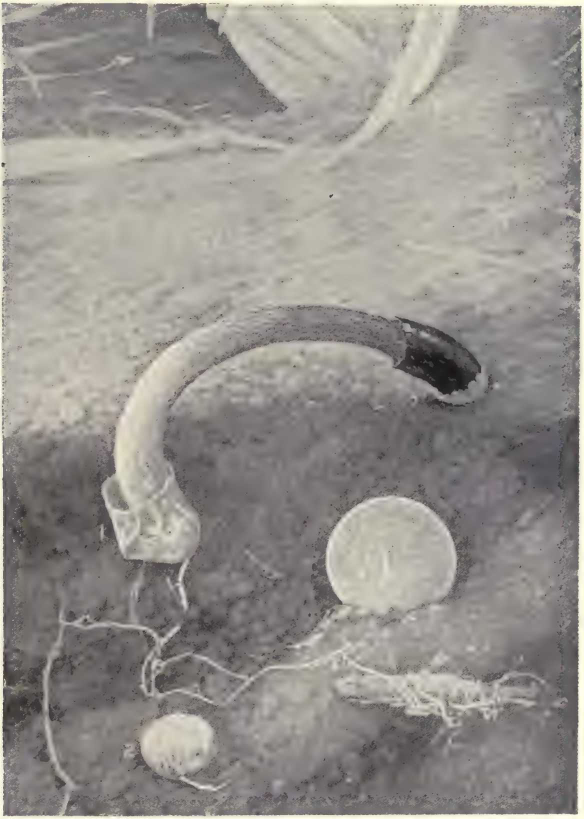

Fig. 171

covered that the mycelium of this phalloid is the cause, at least one of the causes, of a serious blight that affects the sugar cane, known as the "root-disease." How serious this disease is to the sugar grower may be inferred from Mr. Cobb's showing that in Hawaii it causes on an average a loss of ten per cent of the crop.

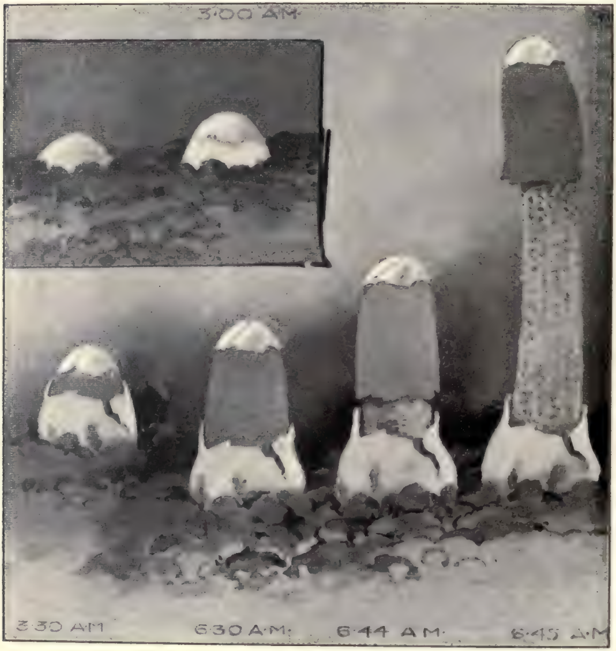

Fig 172

Phalloids have heretofore generally been considered more offensive than harmful, but last year it was announced that the common Phallus impudicus is the cause of a destructive root rot of the vine in Hungary, and this taken in connection with Mr. Cobb's discovery will add, I am afraid, to the disfavor with which many look on these interesting plants.

Aside from the economic importance of Mr. Cobb's paper he gives a most interesting account of the phalloid. He traces its development from the egg to the perfect plant, and pays special attention to the dispersion of the spores by means of insects. His article is illustrated by a number of perfect photographs, of which we reproduce three of the most interesting. Fig. 171 is Phallus aurantiacus, natural size. If you will imagine the figure to have a red stem and a red pileus (when the gleba is washed away) you will have a perfect conception of the species.

It is well known that all phalloids are of rapid development from the "eggs" but I never realized it was so rapid as shown in his figure (172). It does not seem possible that the interval of time between the third and last stages is only *one minute*. This can not be called "growth;" it is elasticity, and Mr. Cobb presents another figure (173) that demonstrates the nature of the mechanism. It is an enlargement (three diameters) of a section of a young egg. The cells of the stem will be seen to be flattened or compressed. As the plant develops they expand and become globose which rapidly prolongs the stem. I know of nothing in plant life with which to compare it, but the way in which a child's "jumping jack" comes out of the box when the lid is opened is somewhat similar.

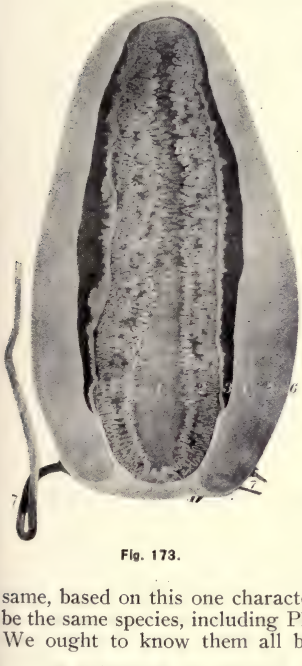

Fig. 173.

Mr. Cobb's paper is marred by but one feature. He discovers this plant to be a "new species," Ithyphallus coralloides. A careful study of his notes shows but one possible difference between it and the usual Phallus aurantiacus of many tropical countries. The pileus is imperforate, and if that is a specific difference there is a species now of Africa, Phallus sanguineus, otherwise the same, based on this one character. I suspect they will all be found to be the same species, including Phallus rubicundus of the United States. We ought to know them all better before we propose new species.

CLATHRUS CANCELLATUS.—Professor Ch. Van Bambeke, of Gand, Belgium, has kindly favored me with additional information in regard to the distribution of this species, extending its occurrence further north than I had supposed.

It is a very rare plant in Belgium, but it has been met at Watermael, near Brussels, by Mesdames Bommer and Rousseau, and Professor Van Bambeke has a specimen that was found at Gand. It has also been noted in Holland by Oudeman, and he states (Revisions des Champignons, Vol. I, page 53) that Linnæus saw it for the first time between Amsterdam and Haarlem in 1735.

We thank Professor Van Bambeke for this additional information, as the Oudeman reference had been overlooked by us.

Phallus impudicus is common in Holland, and Mutinus caninus is a rare plant.

BRASILISCHE PILZBLUMEN, BY ALFRED MÖLLER.—As a good example of how work in mycology should be done we cite the above work. The leading feature of Mr. Möller's work is his excellent, photographic illustrations. The result is something definite, something in which mycologists have confidence. The usual "description" of a phalloid is just so much waste of printed matter. As an illustration, Alfred Möller has proposed from South America a number of "new species" of phalloids, and has illustrated each with fine photographs which he supplements with detailed drawings. Spegazzini has proposed perhaps more from South America, but his work has been mostly vague, verbose descriptions (in Pidgin Latin, according to the latest rules). When Professor Ed Fischer makes a systematic account of the subject, he recognizes every single one of Möller's species, and every single one of Spegazzini's he places in the "Ungenügend bekannte Arten." Even the new genus which Spegazzini proposes and illustrates with a *drawing*, Fischer questions if it were not based on a specimen with an accidental fragment of the volva. If Spegazzini found a plant having the structure that he claims in the genus Alboffiella, and had shown a photographic section, Professor Fischer could not have questioned it. There are pictures in the phalloid history that are known to be "fakes" and investigators in mycology are beginning to be a little suspicious of manufactured pictures produced for the purpose of bolstering up "new species" or "new genera."

We present herewith a reproduction of all of Alfred Möller's species that have not previously been published in our work. All of them are from Brazil.

CLATHRUS CHRYSOMYCELINUS (Fig. 174).—Receptacle white, with large, polygonal meshes, those below somewhat lengthened. The receptacle arms are united at the base into a short stipe.[5] Mycelium bright, golden yellow (hence the specific name). This plant is only known from Brazil.

PHALLUS GLUTINOLENS (Fig. 175).—No description is necessary other than Mr. Möller's photograph (Fig. 175). It has a white stipe and no evident veil. The pileus is smooth and differs from all other phalloids in its *globose* shape. It is certainly a unique species, and is known only from Brazil.

THE GENUS PSEUDOCOLUS.—Far be it from me to go out of my road to propose new genera for plants that already have names, but I can not see any resemblance between the plant from South America that has been called Colus Garciæ and the original species

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[5] Hence it belongs to Fischer's genus Clathrella, a genus that does not impress me very favorably.

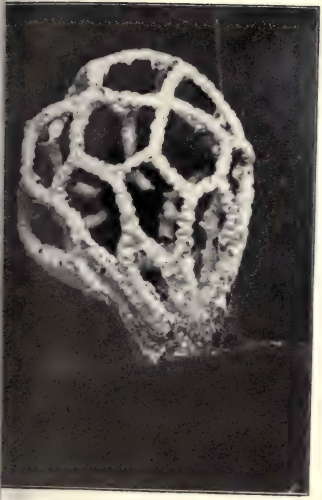

Fig. 174

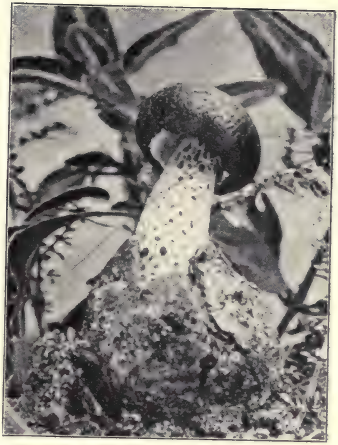

Fig. 175

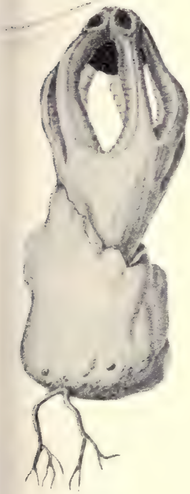

Fig. 176.

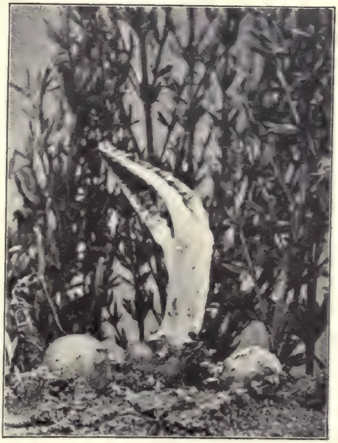

Fig. 177.

Fig. 174—Clathrus chrysomycelinus. Fig. 175—Phallus glutinolens.
Fig. 176—Colus hirudinosus. Fig. 177—Pseudocolus Garciae.

of Corsica that was named Colus hirudinosus. The genus Colus in its original sense (see fig. 176)[7] was a *clathrate* plant with a *clathrate* receptacle consisting of a *network,* bearing the gleba. This network is supported by columns that are united at the base forming a stipe, but the columns are a part of the stipe and not a portion of the receptacle. The genus Pseudocolus, as I conceive it, consists of columns (three always as far as I know) which *are the receptacle* and are slightly united at the top and at the base are borne on a stipe. In short, Pseudocolus is a stipitate Laternea. and as I do not think Laternea should be included in Clathrus, neither do I think that Pseudocolus should be included in Colus.

PSEUDOCOLUS GARCIÆ (Fig. 177).—Receptacle consisting of three tapering columns, slightly united at the top and bearing the gleba on the inner surface. These columns are borne on a distinct stipe. The color is white. Other details are shown in Mr. Möller's photograph better than we can tell them. This plant is known only from Brazil and is said to be rare there. Rev. Rick wrote me he had never found it. It is very close to Pseudocolus javanicus of Java, indeed the photographs could hardly be told apart. Both look very much to me like chicken's feet. Pseudocolus javanicus is a red plant and the walls are "chambered" (gekammert). The Brazilian species is white and the stem walls "ungekammert."[6]

MUTINUS BAMBUSINUS (Figs. 178 and 179).—Alfred Möller presents a photograph (Fig. 178) of this species and it will be noted from the photograph that it is somewhat similar to Mutinus caninus of Europe. It was originally named from Java by Zollinger,[8] and it will probably prove to be the most frequent, tropical Mutinus. It has occurred adventitiously in the hothouses at Kew, and Cooke has given a good figure of it in Grevillea. Also Fischer has given a figure (which we reproduce, Fig. 179) in his account of the Java phalloids. The form that grows in Brazil (Fig. 178) has a shorter gleba-bearing portion than the Javanese form, and Fischer considers the Brazilian plant as distinct under the name Mutinus Mülleri. Alfred Möller unites them under the previous name which Fischer is not disposed to accept. It is only a difference of opinion, such as will always occur between those working on the same subject.[9]

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[7] This figure, which was originally by Tulasne, does not represent the plant as well as does most of Tulasne's work. The clathrate portion is not relatively large enough as shown in his figure. It is more like the receptacle of a Simblum. Besides it is different in its nature from the arms that support it, and there is not the similarity in the receptacle and arms of the plant that there is in the figure.

[6] I do not know the German very well but I presume that "gekammert" stem walls consist of large cells, and "ungekammert" stem walls of small cells. If that is the meaning of it I have never met a phalloid with "ungekammert" stem.

[8] At least Zollinger named something that is supposed to be that. The real meaning of the name is based on a colored figure from Java, now at Kew, that Berkeley referred to Zollinger's name.

[9] And it is unfortunate that under the present system of each author desiring to uphold his own species he becomes (unconsciously perhaps biased. Professor Fischer is a very liberal man in his views of species, bnt there is four times as much difference between Clathrus cibarius and Clathrus gracilis (which he unites as there is between Mutinus bambusinus and Mutinus Mülleri which he maintains are distinct. I have friends in mycology who impress me as being extremely liberal as to others' species and extremely narrow as to their own. This is, I think, one of the unfortunate conditions due to the prevailing system of uniting personality with what should be absolutely impersonal work.

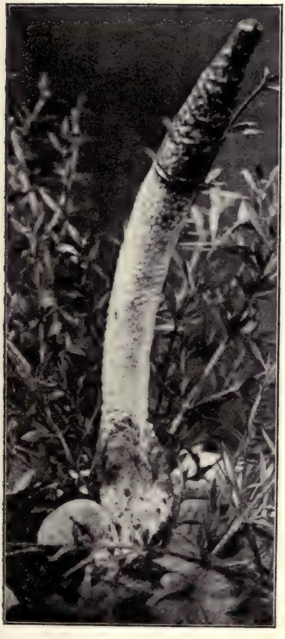

Fig. 178

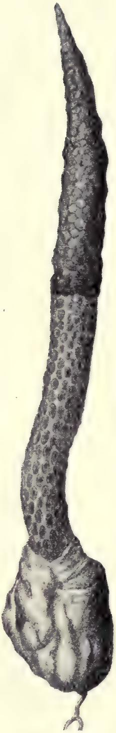

Fig 179.

MUTINUS BAMBUSINUS.

Fig. 178—From photograph by Alfred Möller. Fig. 179—From a drawing by Prof. Fischer.

LONG ON TEXAS PHALLOIDS.—The best paper that has ever appeared on our American phalloids is by W. H. Long, Jr., in the May number of Kellerman's Journal. You may hunt the phalloid literature all through and you will find but three papers on local phalloids that are of any particular credit to the authors. First, by Penzig on the phalloids of Java; second, by Möller on the phalloids of Brazil; third, by Long on the phalloids of Texas. All three papers are finely illustrated and give full accounts of the phalloids *both old and new*, and are in strong contrast to the usual mycological literature devoted to the exploitation of "new species" only.

Mr. Long finds five species in Texas, as follows, and he gives excellent photographs of all of them and full accounts from his observations of the growing plants.

PHALLUS IMPERIALIS.—This is abundant in Texas, and is, as we have previously pointed out, only a pink form of Phallus impudicus, and the onl form we seem to have in the United States.

PHALLUS RUBICUNDUS.—Mr. Long finds this abundant, usually in lawns and grassy places. He gives the first good account of it that we have in American literature. We have already published Mr. Long's photograph (Myc. Notes. page 330, plate 116). The veils of this species, as of the preceding, are full discussed, and he reaches the conclusion that the development of the veil in the genus Phallus is a varying factor in the same species and can not be used (successfully) as a basis of subdivision of the genus into "two new genera" as most modern authors are doing. This is fully in keeping with our own views a stated on page 327.

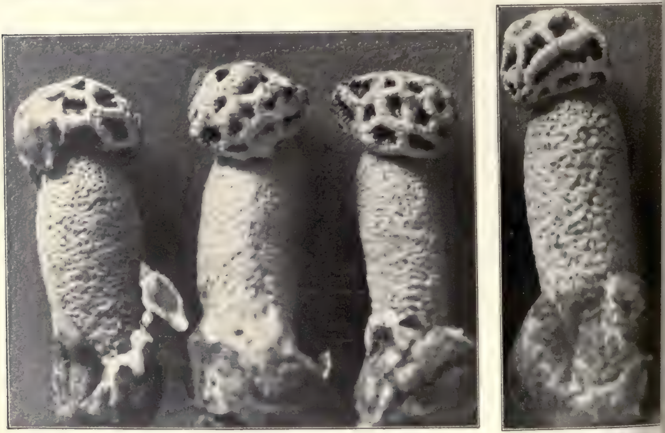

Fig. 180.

MUTINUS ELEGANS.—Mr. Long considers this plant under the erroneou name Mutinus caninus. I think he has confused Professor Burt's paper. Mut nus Ravenelii in my opinion is not the same as Mutinus caninus of Europe a considered by Professor Burt, but the plant that Mr. Long calls Mutinus caninu is the plant that Burt called Mutinus Curtisii. Professor Burt suggested (as I have since fully assured myself) that it is Mutinus elegans. Mr. Long's figure is characteristic of Mutinus elegans, which is very different from Mutinus caninus of Europe.

SIMBLUM SPHÆROCEPHALUM (Fig. 180).—We are glad to give a nice photograph of this plant, made by Mr. Long. The figure we gave (page 297) was from an abnormal plant. It is a rare plant in Texas, though a very abundant species of South America. Mr. Long's photograph tells the whole story excepting as to colors. The volva is white, the stipe pink and the receptacle scarlet. (Sometimes white forms are found.)

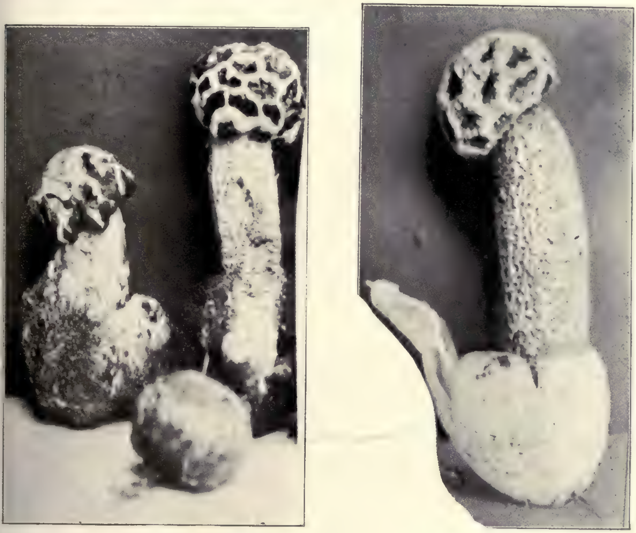

Fig. 181.

SIMBLUM TEXENSE (Fig. 181 from photographs from Mr. Long).—From he photograph one might think this is the same plant as the preceding, but it s quite different not only in its color but in other respects. The color of the ntire plant is pale yellow. Mr. Long points out a number of characters in which his species seems to differ from other phalloids. "When *fresh* the gleba and *ntire* plant has a very pronounced and *pleasant amyl acetate* odor."* "When t does deliquesce it has the odor of carrion." Another peculiar character is the road, ovate spores. Mr. Long's complete and full account of Simblum Texense ully refutes Atkinson's story of it being a "new genus" Dictybole. The only oint that Mr. Long does not cover is what difference (if any) exists between t and Simblum gracile of Ceylon, and I think nobody knows that.

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*If we really knew the truth about phalloids, I presume this feature would not be as exeptional as Mr. Long thinks. The fetid odor that seems to be a strong character of all phalids is only developed when the gleba deliquesces. I was unable to detect any odor to Phallus mpudicus in France after the plant had fully developed but before the gleba had deliquesced. erhaps had my olfactory nerves been in good working order I might have noted "the odor of iolets" as I think did the English author who called it "Phallus iosmos" on that account. erhaps this is a better explanation of "Phallus iosmos" than that given in Myc. Notes, p. 328.

THE GENUS MUTINUS.—In my previous articles on the phalloids I have stated the distinctions that exist between the three forms or species of Mutinus that occur in the United States, but it will not be amiss to summarize them again.

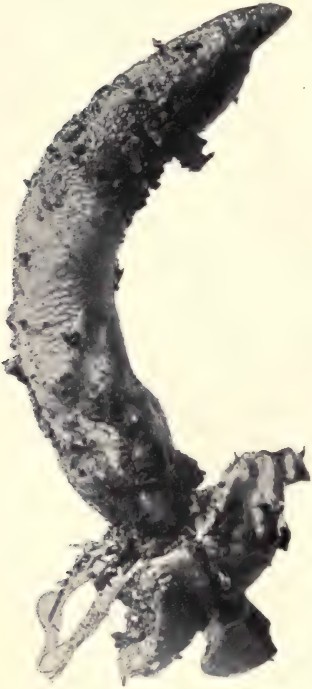
Fig .182.

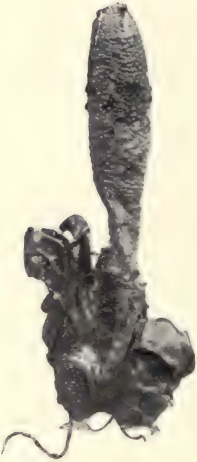
Fig. 183.

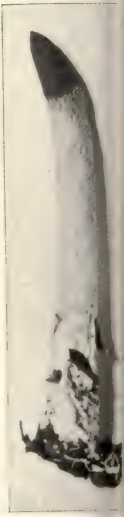
Fig. 184.

THE THREE FORMS OF MUTINUS.

Fig. 182 Mutinus elegans. Fig. 183 Mutinus Ravenelii. Fig. 184 Mutinus caninus.

MUTINUS ELEGANS (Fig. 182).—Stipe cylindrical, tapering to the apex Cellular structure uniform. Gleba-bearing portion not definitely defined. This is our most common species and is the only species that is usually met in our western states.

MUTINUS RAVENELII (Fig. 183).—Stipe club-shaped, thicker above and contracted below. Cellular structure uniform. Gleba-bearing portion not definitely defined. This is a rare form, at least around Cincinnati, and it is no certain that it is other than a form of the preceding plant.

MUTINUS CANINUS (Fig. 184).—Stipe cylindrical, subequal in diameter The gleba-bearing portion short and sharply defined. Cells of the stem large than those of the gleba-bearing portion. This is the original species of Europe and appears to be very rare in the United States.* I have received it but once (from James Fletcher, Canada) and have seen but one photograph of an American plant that I think should be so referred. I am pleased to present this photograph (Fig. 184) recently received from Professor M. E. Hard, Chillicothe, O.

In the above summary I have made no mention of the color. They are all pink, flesh color to orange red, and are not distinguished by their colors. Mutinus caninus (in Europe at least) is said to sometimes have a white stipe.

ATKINSON'S BREAK.—Mr. Long states that Atkinson's "new genus" Dictybole is based on Simblum Texense, and Mr. Long ought to know for it was he who sent Professor Atkinson the material on which the genus was based. It seems that when Long was a student at Cornell under Professor Atkinson he left with him some eggs of a phalloid that developed into something that looked strange to Atkinson. He drew a picture of it (that has no possible resemblance to the plant, see fig. 64 page 130) and on this figure the new species and genus "Dictybole Texense, Atkinson and Long" was based. Long's name seems to have been added in the nature of a "jolly" for he writes me it was done without his knowledge or consent. It is an illustration, however, of the usual value of these advertising formulæ as applied to "science." After the "new genus" had been published, Mr. Long sent me some dried specimens and while I did not claim to know much about phalloids, I recognized that it was an old genus that was well known and well illustrated before Atkinson was born, and I thought it was probably an old species (Simblum gracile of Ceylon) as well. The whole story is illustrative of the troubles that are liable to overtake those who start out on their search for new species before they learn the old genera.

THAT "STRANGE PHALLOID EGG."—On page 83 (some years ago) I noted a strange phalloid egg that reached me from a correspondent and which was considerable of a mystery as it had the form of an acorn. I have since received similar eggs several times and have long since come to the conclusion (as Mr. Long recently suggested) that the strange egg was due to unequal contraction in the drying of the egg of some common species. The strangest part now is why phalloid eggs should dry in this manner. We present (Fig. 185) a specimen recently received from W. T. Lakin, Maryland.

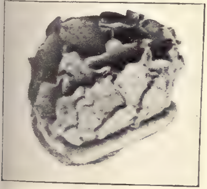

Fig. 185.

Our correspondent, who originally sent the specimen, was quite positive that the fresh egg was this same acorn shape, but I think ow she must have been mistaken.

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*In two instances recently, in Kellerman's Journal, other species have been illustrated nder this name.

A MARE'S NEST THAT PROVED INTERESTING.

We have received so many puff balls from the eastern and central sections of the United States that we thought we knew every form that could possibly occur there. The discovery of the new Whetstonia in Minnesota last year indicated that we probably might be mistaken and that other forms do occur that have not reached us.

Dr. A. Hrdlicha has been very kind in sending me a large number of specimens collected in the vicinity of Washington, D. C. In a box recently received there was an immature puff ball that I felt sure would prove to be something novel. It had the general appearance of being an immature Scleroderma Geaster, but examination with the microscope showed hyaline, branched, septate capillitium threads, and the genus Scleroderma has no capillitium threads. I immediately became very much interested and wrote to Dr. Hrdlicha to secure more mature specimens if possible, which he did without trouble and they reached me in quantities in a few days. They are our old friend, Scleroderma Geaster, that has probably been sent in and named correctly a hundred times.

The supposed capillitium threads have disappeared from the mature gleba and were in reality hyphæ tissue threads, the existence of which in immature Sclerodermas was unknown to me. Immature Sclerodermas of course reach me frequently and I have often examined them, but have never noted anything that could be correctly designated as threads. The genus develops under the ground and it is quite probable that all have these threads in very early conditions. The usual immature specimens picked up after the plants appear on the surface of the ground have passed the early deliquescent stages, and this thread-like tissue probably disappears before the plants emerge from the ground. Dr. Hrdlicha's find did not prove to be a novelty, but what is of more importance to my mind it demonstrates a new fact about an old genus—that is—new to me

NOTELETS.

MUSEUM SPECIMENS.—I saw a specimen in a "show" department of a museum in Europe, labeled "Geaster radicans, Berk., the only collection ever made in Europe." The statement is as nearly correct as many of the labels of specimens in the museums, neither statement being true. The specimen is Geaster fornicatus with no relation to Geaster radicans, and "Geaster radicans, Berk." (viz. Geaster Welwitchii), *has been* collected in Europe.

CONGRATULATIONS—are in order to Professor Massee, who has just written an interesting book entitled "A Text Book of Fungi." It is well written, well illustrated, and full of information, and presents a general résumé of the fungus field in a better and more entertaining manner than any book that has previously appeared in English. Berkeley's "Cryptogamic Botany" was too technical. Cooke's "Introduction" was a decided improvement and Massee's is the best of all. I am particularly glad to note that in not a single instance has Professor Massee found it necessary to add a personal advertisement to the name of a plant. A book devoted to information about fungi and not interested in biographical puffs of those who devote their energies to juggling the names of plants, is a decided novelty.

THE VIENNA RULES.—In reply to a request for details as to the Vienna Rules, we have not paid much attention to them. However, the sum and substance is—"We, the Germans, we are *the* people. What we do is right, and what we don't do is wrong. Engler and Prantl is the new Gospel—and Allah be praised." Is it any wonder that our American contingent that went over to pull through Kuntzeism and found themselves in such a hopeless minority, and got so badly snubbed, came home and—seceded?

"PIDGIN LATIN," p. 340, is wisdom itself. The language a man can use best he can not use too well when he essays to describe new species. Some descriptions in the describer's vernacular are difficult enough to apply. The difficulty would be increased by doing poor mother-tongue into poorer Latin."—J. D., Canada.

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 29.

CINCINNATI, O. JANUARY, 1908.

P. A. SACCARDO

(Born 1845, Photo 1891.)

The above portrait is of a man, than whom no one in the mycological world is better known. Fries brought together in a systematic form the Hymenomycetes of Europe. What Fries did for the fungi of Europe, Saccardo has done for the fungi of the world, excepting that Fries' work is of such great value because it is based mostly on field observation, while Saccardo's work from its very nature is largely a compilation. To collate and arrange in a systematic manner the 31,927 descriptions of fungi that are included in the first eight volumes of "Sylloge Fungorum" was a monumental task, and when the undertaking was announced no one believed that it would ever be brought to a successful finish. The fact that it was finished is a living monument to the energy, perseverance and pluck of the man whose portrait heads this article.

When this work was completed in eight volumes, in 1889, the mycological world then had a basis on which good work could have been done, for the true investigator who wishes to learn the truth about a subject, has his work more than half finished when some one publishes a good index of the subject. It is a question, however, if the completion of Saccardo's Sylloge has on the whole advanced the science of mycology: on the other hand it has probably greatly retarded it. When the final truth is known about fungous flora of the world it will be found that "species" are of wide distribution, and that the fungous flora of the entire world is practically the same. The main object of the student should be to find out what these species are, their relationships, how they resemble and how they differ from each other and their distribution.

Since the appearance of Saccardo's work, and before too for that matter, the chief object of most mycologists appears to be to hunt for "new species." A local worker finds a fungus that he is unable to determine. He looks through the section of Saccardo where it ought to be, does not find anything that exactly fits it and announces that he has discovered a "new species." The probabilities are, in three out of four cases, that he has simply failed to recognize an old species, and that he could not recognize one out of ten of the old species from any descriptions that have been published of them[1]. The appearance of Saccardo's completed work, therefore, did not in the main lead to a better knowledge of the subject but has in fact greatly complicated it by stimulating the production of a host of "new species," now almost equalling the original number of twenty years ago, when the field was first covered by Saccardo's original eight volumes. We can not blame Saccardo's work, however, for this result, though it undoubtedly led to it, any more than we can blame the monumental "Index Kewensis" for the extent of useless name juggling that it made possible. When Saccardo completed his eight volumes, the mycological world then had a basis on which to produce lasting work—but failed to rise to the occasion.

FOREIGN NOTES.—An article, supposed to be on Polyporii of the Philippines, recently appeared in one of the New York publications. It seems to be in some barbarous language, unfamiliar to mycologists, and is probably intended for the use of the Igorots.

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[1] I do not refer to local work of course. It is not only possible but practicable to recognize the greater part of the Hymenomycetes *of Sweden* from Fries' work *but not out of Sweden*. In the United States it is possible to recognize the greater number of the agarics one meets in those genera which Professor Peck has *systematically monographed*, but not from his *isolated descriptions* of "new species" in those genera which he has not brought into systematic order.

CONCERNING THE PHALLOIDS.

CLATHRUS CRISPUS.—We have received a dried specimen (Fig. 186) of this species from Mr. William Cradwick, Jamaica, and it is one of the species that has never been illustrated by a photograph and we hope Mr. Cradwick or some other of our Jamaica friends will photograph the first specimen they come across. The dried specimen has the arms strongly wrinkled as shown in our photograph (Fig. 188) which is an enlargement six diameters, made from Mr. Cradwick's specimen. Whether or not this is a feature of the fresh plant I can not say, and it is for this reason that a photograph of the fresh plant is particularly desired. The original drawing by Turpin (Fig. 187) seems to be characteristic, but we should be much better satisfied if we had a photograph.

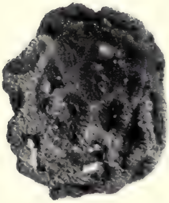

Fig. 186

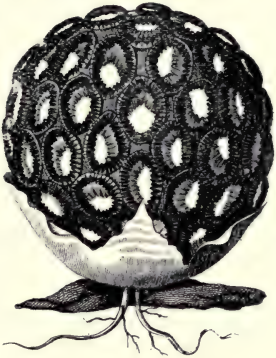

Fig 187.

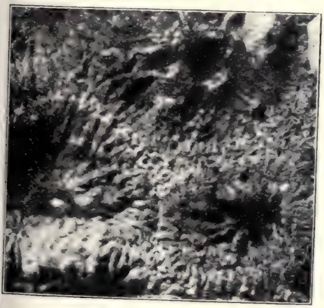

Fig. 188.

THE PHALLOIDS OF BRAZIL.—There is probably no country in the world where the phalloids are better known than Brazil, owing to the excellent work that has been done with them by Alfred Moeller. Father Rick writes me that he finds in his immediate vicinity the following species: Simblum sphaerocephalum, Phallus indusiatus, Laternea columnata, Pseudocolus Garciae, Blumenavia rhacodes, Protubera maracuga and a Clathrus, species doubtful, close to delicatus. The genus Protubera is a doubtful genus included in Phalloids by some and in the Hymenogasters by others. In my opinion there are a group of these genera with dry, hyaline, elliptical spores which should be classed together. This group includes Protubera, Mesophellia, Castoreum and two other Australian genera, as yet unnamed.

PHALLUS RAVENELII.—Mr. E. B. Sterling, Trenton, N. J., has just sent me an abundant collection of Phallus Ravenelii in all stages of development. He found it growing in decayed sawdust where it developed its mycelium in great abundance and produced hundreds of the fruiting plants. The mycelium cluster with its numerous eggs was so interesting that I have made a photograph of it, fig. 190. Mr. Sterling states that the mycelium and eggs are white when first opened from under the ground, but the action of the atmosphere quickly changes them to a lilac or purplish tint.

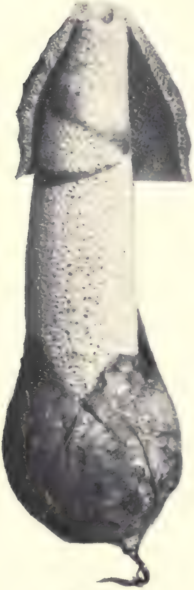

Fig. 189.

I also note that Mr. Sterling's specimens present some characters that are new as to this plant. All of the specimens have very prominent apical collars. This apex is perforate in some specimens but not in all. As in early times phalloids were sometimes classified as to whether this apex was perforate or not, this fact should do away with one of the old traditions. The veil on the specimens was very slightly developed, as shown in figure 189. Indeed, it was not much stronger than one finds ordinarily in a Mutinus or on Phallus impudicus. To my mind the relative development of a phalloid veil has no value in classification. We know specimens of Phallus Ravenelii now that have veils which are merely rudimentary. (Fig. 189.) Around Cincinnati they are generally developed but hidden under the pileus (See plate 115, fig. 3.) and in Mycological Notes, page 350, fig. 168 is shown specimen where the veil protrudes. Like the development of the sterile base of a Lycoperdon the development of the veil of a phalloid seems to be a very varying character.

SIMBLUM SPHAEROCEPHALUM.—This is a rare phalloid in the United States, often called Simblum rubescens. Dr. D. S.

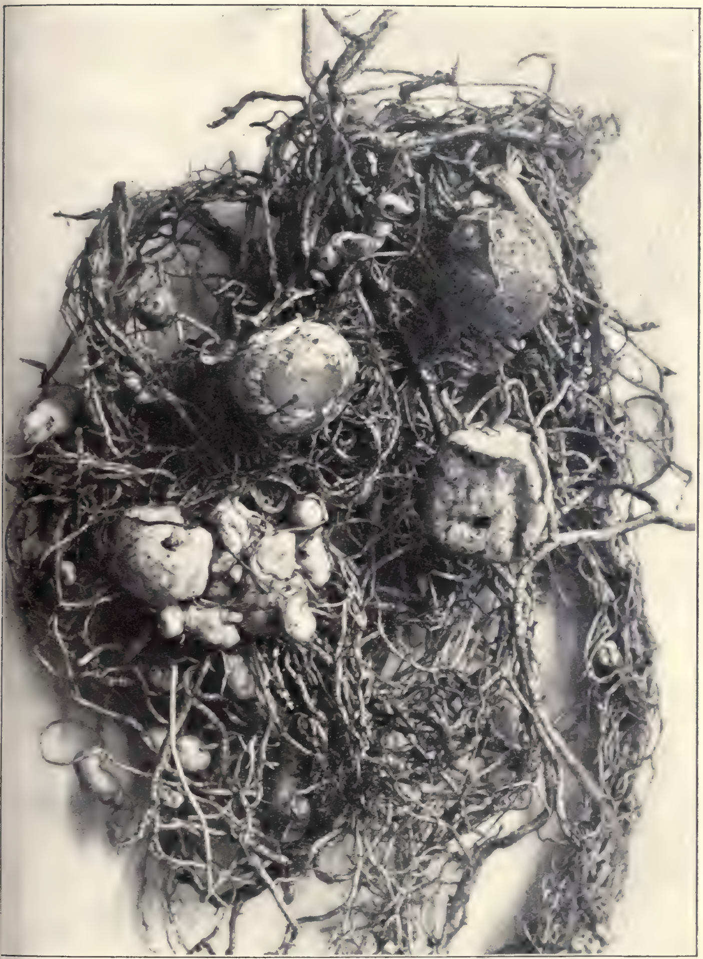

Fig. 190.

MYCELIUM AND EGGS OF PHALLUS RAVENELII.

Johnson reports the occurrence of the plant at Cold Springs Harbor, New York, in 1900, 1901 and 1902. All grew on one spot and the last year only one or two specimens.

MUTINUS RAVENELII.—At the last visit I made to Professor A. P. Morgan, a few weeks before his death, we had a conversation about this plant. Professor Morgan was of course quite well acquainted with Mutinus elegans, in fact he at one time discovered it was a "new species," for Mutinus elegans is not an unusual plant in the woods in the section around Cincinnati. Professor Morgan during the past summer collected Mutinus Ravenelii, and he told me he was strongly convinced that it was an entirely different plant from Mutinus elegans. It is a smaller plant, different in shape and particularly different in its habitat. The habitat of fungi, a feature usually neglected, is very often one of the best characters that a species has, for most fungi have this peculiarity, that they will only grow in a certain habitat. Mutinus elegans always grows in woods or in soil that is rich in humus. Professor Morgan found Mutinus Ravenelii growing in an old corn field in clay soil. It has been cultivated for years and was particularly free from any woods humus. I never collected the species but once and then it was in a similar situation in a yard in one of our city lots. I believe that Mutinus elegans and Mutinus Ravenelii are distinct things and that habitat is one of the strong points of distinction.

MUTINUS CANINUS.—Professor Beardslee found this species the past season in Maine, and he told me it was rather frequent. It was very distinct from Mutinus elegans, and he readily recognized it from the characters pointed out in Mycological Notes.

RED LYSURUS.—I have received reports of the occurrence of red specimens of the genus Lysurus from

Harold Murray, Manchester, England,
Professor D. McAlpine, Melbourne, Australia,
W. H. Long, Jr., Denton, Texas.

None of these specimens have reached me but I expect they will all prove to be a red form of Lysurus Gardneri. It is an evidence of how little our phalloids have been observed that not a *red* Lysurus has ever been recorded from *either* of these *three countries*. There have been three vague records of red Lysuri, two of them from South America and one from South Africa, and I suspect there would be very little difference found between any of them if the truth were only known.

THE PHALLOIDS OF MAURITIUS.—Mr. Charles A. O'Connor has sent us three phalloids in alcohol from the island of Mauritius. They reached us in good condition and all of them are unrecorded from this island.

The first is Phallus gracilis, or Phallus aurantiacus var. gracilis, if you wish, which is a common tropical form no doubt throughout the tropical world. It has recently been demonstrated to be the cause of the destructive root rot of sugar cane in Hawaii. Mr. O'Connor's specimen has the pileus more acute than the Hawaiian plant, but otherwise it appears to be the same. I am informed by Mr. O'Conner that this species is the only common phalloid in Mauritius.

The second is a small specimen of Phallus indusiatus, as described in Mycological Notes, page 332, and illustrated plate 119. With the exception that his specimen is smaller than the ordinary form it is the common species throughout the tropics.

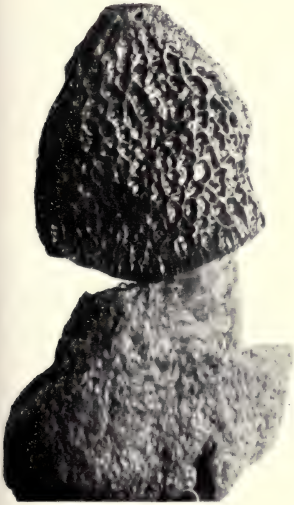

Fig. 191

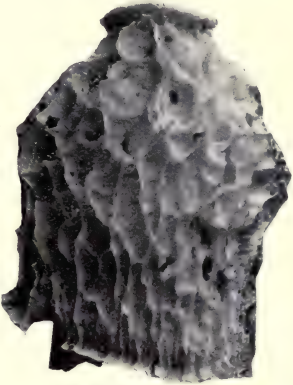

Fig 192

The third is of considerable interest, being, I believe, the same plant we have so common in the United States, namely Phallus duplicatus, and this is the first record to my knowledge outside of our own country. On comparison of Mr. O'Connor's with our American plant I can note very little difference excepting that the reticulations of the pilei of the two forms are not exactly the same. The Mauritius form has shorter and deeper meshes. Our Figs. 191 (from Mauritius) and 192 (from America) will show this difference. As to the veil it seems the same as the American form. It shrivels in alcohol so that it appears as a membrane. Professor Fischer is disposed to consider Phallus duplicatus and Phallus indusiatus as the same species, but I feel assured if he could see the two specimens from Mr. O'Connor side by side that he would concede a difference. The most marked difference is in the veil which in Phallus indusiatus is of large meshes formed of thin network and retains its net-like appearance in alcohol. Phallus duplicatus, on the contrary, has a veil of smaller meshes and thicker threads which in alcohol shrink up and appear almost like a solid membrane.

None of these three species, we think, have been recorded previously from Mauritius, and Mr. O'Connor has not found the only phalloid heretofore known from this island, namely, Simblum periphragmoides.

CONCERNING THE POLYPOROIDS.

FOMES NIGRICANS.—The fact that there are two very different plants referred to Fomes nigricans, "Fries," by different botanists is not generally appreciated.

First, there is a Fomes (Fig. 193) growing very common on birch, which is in reality a form of Fomes igniarius, with a *smooth*, *black*, *shining* crust.[2] It is called Fomes nigricans, "Fries," by Quèlet and Patouillard, and is the plant beautifully shown in the recent plate by Boudier. I have only collected it on birch, but have specimens from France, on willow, which are so referred. It has the same colored context, the same spores (subhyaline, compressed

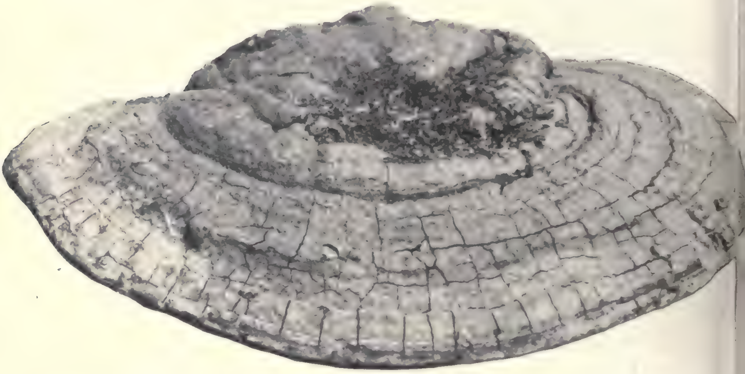

Fig. 193.

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[2] The type form of Fomes igniarius, as it grows in great abundance on all kinds of frondose trees in Sweden, has a rough, rimose, black crust, very much resembling, in general appearance, Fomes rimosus. Last summer I found both forms in northern Canada, the rough form on poplar, the smooth form in great abundance on birch.

globose, 5–6 mic.), and has a peculiarity I have often noted in Fomes igniarius, which was not overlooked in Boudier's plate, though never mentioned, to my knowledge, in books. The old tubes have a white deposit (lime, I presume), which shows plainly in a section of the pileus of Fomes igniarius, but not any other species, to my knowledge. If this is the true Fomes nigricans of Fries, and I presume it is, then I should consider it a form of Fomes igniarius, but well worthy of a name.

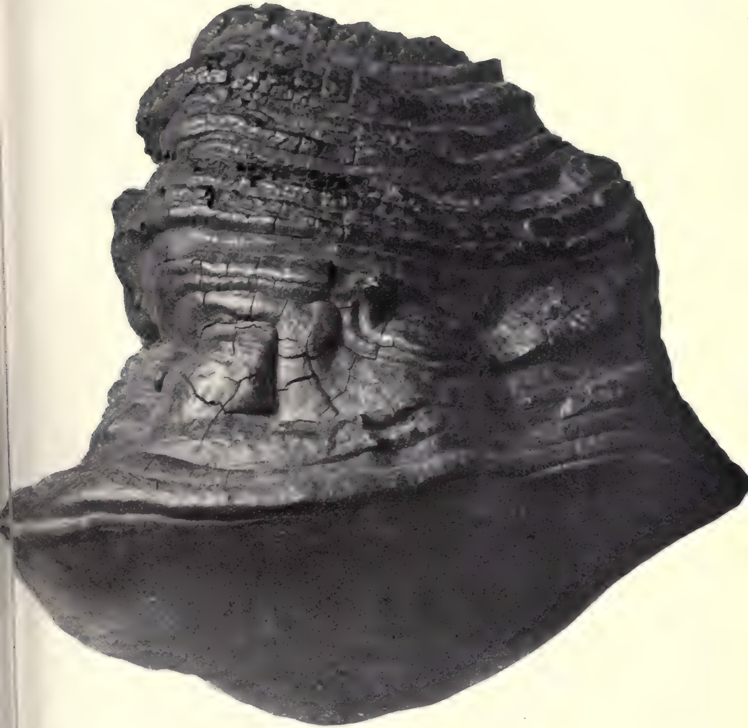

Fig. 194

Second, there is a Fomes, in reality I think a form of Fomes fomentarius, which was called Fomes nigricans, "Fries," by Bresadola (Hym. Hung. Kmet, p. 10[3]), and is so known to some mycologists in

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[3] Rev. Bresadola was mistaken in referring here Polyporus roburneus cfr. Myc. Notes, p. 341), but otherwise his reference is to this plant.

France to-day. I received a beautiful specimen, so named by Monsieur L. Ludwig, Paris (see Fig. 194, made from the specimen). I also have a specimen from C. Engelke, Hanover, Germany, and one from Rev. Bresadola. It is not "Fomes fomentarius, of advanced age and indurated," as stated by Mr. Murrill, being more distinct, in fact, from the usual form of Fomes fomentarius than the previous plant is from Fomes igniarius. It has the same context, long stratified pores and peculiar pore mouths as Fomes fomentarius, but has a black crust, *strongly concentrically sulcate.*[4] I do not question but that it is a form of Fomes fomentarius, but it is well worthy of a distinct name.

FRIES' VIEWS.—I can not say which of the preceding was Fomes nigricans in the sense of Fries, for I have not as yet investigated the polyporoid situation in Sweden. It is difficult to decide from his writings, for they appear to refer to both. His "forma typica," I think, must be the second plant, as Bresadola has it, for Fries compares it to Fomes fomentarius and his Icones (t. 184), while not characteristic of either comes nearer the second plant. The "forma trivialis," from his figures cited (Rostkovius and Quèlet), are surely the first plant. I hardly know how we can decide which to call "Fomes nigricans, Fries," though if we leave off the "Fries," Fomes nigricans of most authors refers to the first plant.

PORIA EUPORA.—Plants that have been received from Professor Otto Jaap are exactly the same as the plant that has been called Poria attenuata in this country. I collected it recently at Albany, and the American name was advised by Professor Peck. I think one would hardly find it in Fries' Hymenomycetes among the "yellowish" species When fresh, it impresses me as being more red than yellow, and Professor Peck's color term, "pinkish-ochre," quite well expresses it. In drying, it loses some of the red, but I feel it can never be called "yellow." I am not sure, but think Karsten "saw it first," therefore must get the advertisement.

POLYPORUS PICIPES.—We have a Polyporus in the United States that has no technically valid name. It is generally called Polyporus picipes, "Fries," and the name Polyporus picipes is as good a name as could be given to it, though it should carry Berkeley's advertisement, for it was due to the determination of Berkeley that the plant acquired this name in the United States. In my opinion, it is not the same plant as grows in Europe, and therefore it is somewhat misleading to apply a name to it originally proposed for a European plant. It is, however, generally held now-a-days that there is no use for the name in European mycology, the plant so called there being the same as Polyporus varius, and as the name is superfluous in Europe, I see no reason why we can not take the name for our American plant. Particularly as it is so very appropriate and so well established in America, and by simply substituting "Berkeley" for "Fries" in the advertisements it would be correct. It appears to me as much more sensible than to adopt, as Mr. Murrill proposes, Polyporus fissus, for a plant that is never normally "fissile," and if ever "fissile" is the result of an abortion and deformity.

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[4] There are two usual forms of Fomes fomentarius, one on birch, which is harder, smaller, slightly sulcate; the other on beech, which is softer, larger, and even. Both have light-colored crusts, and were very abundant and distinct on their respective hosts at Barbizon, France.

Polyporus picipes is a frequent plant in the United States, and is very close to Polyporus varius of Europe. Indeed, there is no doubt in my mind but that it is the American form of the European plant, but it differs in being a thinner plant and in having smaller pores. Schweinitz and Montagne[5] both referred our plant to Polyporus varius and Berkeley to Polyporus picipes,[6] the latter a name now genally conceded to have no existence, even as a form in Europe. The name Polyporus picipes has always been used in American mycology for the plant, and while not technically correct, it is practically so, and infinitely better than a name that has no application whatever to the plant, and which is based solely on specimens so abortive that they were not recognized by the author.

POLYPORUS LEUCOMELAS.—We recently received a specimen from a correspondent under this name, which we listed under the American name Polyporus griseus as we are not familiar with the European plant. It did not seem it could be the same plant that Fries has figured. The recent picture by Boudier, however, strongly suggests to me that in the end we shall have to refer our Polyporus griseus to the European species, Polyporus leucomelas.

What a pity it is that we do not have a set of illustrations of the European plants on which we can depend, and that Boudier's plates cover so relatively few of the larger fungi. As it is now, we look up these illustrations in Europe and the most uncertain thing about them is how nearly they represent the plant.

* * *

SPEAKING OF "TYPES".—Some one has mounted on the same sheet an alleged specimen from India that Berkeley has named "Polyporous (blank) Nilgherries (locality) E. S. B." and a fragment from South Carolina from Ravenel (No. 2494) that Berkeley had named "Pol. hypolateritius B." and Cooke publishes (Grev. 15-24) "Poria hypolateritia, Berk., Ad ligno, India." Will some one be kind enough to inform me which is the type?

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[5] When Montagne got some little, abortive specimens from Sullivan that he *could not recognize* he called them Polyporus trachypus and Mr. Murrill gravely informs us that "his description is accurate and quite complete." If it is, Montagne must have been a wizard of some kind to draw such a description from specimens so abortive and incomplete that Montagne himself could not recognize them. When he received fine, typical specimens, now in Montagne's herbarium, of the plant from the same collector, Sullivan, *he referred them* (as they probably are) to *Polyporus varius*.

[6] The plant is usually three or four inches in diameter, and Berkeley referred to Polyporus varius a *good specimen* that he got from Ohio, typically representing the American plant, and the specimen is now at Kew, mounted on the same sheet with a specimen from Fries. In another cover there are two little depauperate plants from Lea, the small one about the size of your thumb nail, the other a little larger, and *neither fissile*, so deformed that, if they belong to this species, Berkeley *did not recognize them*, and he called them Polyporus fissus. If he got any "fissile" ones, they are not now preserved. The plants are so deformed that it is hard to say whether they are or are not the plant Berkeley usually referred to Polyporus picipes. Mr. Murrill decides they are, though Berkeley never knew it, and on such evidence would change a well-established name. It appears to me as carrying "priority" a long ways beyond the limit of reason.

A VISIT TO PROFESSOR PECK.

During the month of October, last, I spent a couple of weeks in the study of the specimens (principally polyporoids) in the museum at Albany. Professor Peck has gotten together a fine collection well representing the fungous flora of New York.

I am glad to state that Professor Peck is well and vigorous and busily engaged on a monograph of New York Pholiota that will probably appear in the next Report. I consider these agaric monographs the most practical and best literature we have on the subject in this country, and if they are finished will be the basis for all future work on our agarics. In my opinion, no one in this country has as good a field knowledge of agarics as Professor Peck, and I hope he will put forth every endeavor to leave his work, as Fries did, in a complete form.

I learned a number of polyporoids that Professor Peck has named, which I had not known, and also the names of several that I have received from correspondents and which I was unable to determine. The following species named by Professor Peck I consider very distinct and good "new species," as far as I know:

Polyporus admirabilis
" albiceps
" albellus
" caeruleoporus
" crispellus
" delectans
Polystictus dualis
Fomes fraxinophilus
Polyporus hispidellus
Polyporus humilis
Polystictus planus
Polyporus volvatus

I have not included the Porias in the above list, as I know so little about the Porias at present that I do not pass opinions on them.

Polyporus admirabilis is a most striking plant, which seems to occur only in our extreme northeastern states. I have a beautiful specimen collected by H. E. Warner at Grafton, N. H.

Polyporus albiceps I have from Dr. Herbst. Polyporus albellus I have gathered in Vermont. Polyporus caeruleoporus I have from G. U. Hay and also from J. Vroom, Canada. It is as rare as it is beautiful. Polyporus delectans and Fomes fraxinophilus are frequent around Cincinnati. Polyporus humilis I had from Dr. Glatfelter, St. Louis. Polystictus planus from Dr. Whetstone, Minneapolis. Polyporus volvatus I have received from a number of correspondents, including one collection *from Japan.*

Polystictus dualis, I have collected in northern Canada. Mr. Murrill refers it as a synonym to Polystictus tomentosus, to which opinion I can not subscribe. I gathered the past season at Lake Temagami (northern Canada) Polystictus circinatus (which Mr. Murrill refers under the name P. tomentosus) very abundantly, and when I found Polyporus dualis there was to me no suggestion even of the other plant. The microscope shows them very similar in structure,[1] but they are so different in form and habits that I think no one who collects them would refer them to the same species.

As to the following I am somewhat in doubt. They seem to me too close to other species, though at present I would not refer them as synonyms.

Polystictus balsameus is close, I think, to that puzzling pubescens-versicolor-velutinus-zonatus group that gives us so much trouble. It has no resemblance, however, to Polystictus pergamenus, as Mr. Murrill refers it.

Polyporus flavidus (which was changed to Peckianus) is apparently a rare plant and collected by Professor Peck but once. It is mesopodal, greenish yellow, and seemed to me close to flavidovirens, though the pileus is smooth, zonate.

Polyporus maculatus (changed to guttulatus) and Polyporus immitis, semipileatus and undosus all belong to that Apus carnosi section of Fries concerning which I think very little is known in this country.

The following synonyms have long been a part of the current knowledge of American fungi and most of them Professor Peck has published:

abortivus=distortus
Beatiei=Berkeleyi
hispidoides=Schweinitzii
Morganii=radicatus

The following have been mostly published by others, and are well known:

Aurantiacus=fibrillosus, as published by Karsten and Bresadola. While there is no question that the plant Karsten distributed as Polystictus fibrillosus is the same as the plant Peck named Polyporus aurantiacus, the latter is much the better name, and "*a plant that is well named is half determined*,[2] and I think the plant is entitled to a good name.[3]

Aureonitens I think is a young condition of radiatus as published by Mr. Murrill.

Fragrans I would consider at the best a form of adustus. The dried specimens are indistinguishable, but this form *when fresh* has a pleasant anise odor. The same form occurs in Europe.

Glomeratus is nodulosus of Europe (not radiatus as Mr. Murrill states). Nodulosus is given by some authors in Europe as a form of radiatus but appears to me very different. Fries' illustration of it is not good.

As to griseus I am in much doubt. I have seen it determined as leucomelas of Europe but I could never see any resemblance to Fries' figure. However, since the appearance of Boudier's figure, which is a good illustration of our fresh American plant, as I remember it, I am beginning to think it is the European plant, particularly as it has spores that are exceptional among the Polyporii and Boudier's plate shows such spores.

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[1] When mycologists write learnedly about "same structure" they usually mean that it has the same spores and cystidia, or colored setae, but that is not true in this case, for the colored setae of dualis are peculiarly curved while those of circinatus are straight.

[2] A familiar and true saying of my friend, the late Dr. Herbst.

[3] Personally I have not much sympathy with the childish argument that mycologists are prone to resort to—"that is mine—I saw it first." I do not believe that any one should knowingly change the name of a plant because it is badly named, but when a plant has two names, one very good, one very bad, and neither much used, I at least think the *better should be chosen*. We hear a great deal nowadays about the "rights of priority." Have not the poor plants the inherent right to be decently named?

Polyporus splendens and simillimus.—I will consider these plants soon in an article on Polystictus perennis and related species. The current synonymy as recently compiled by Mr. Murrill is very inaccurate and does not at all agree with the type specimens.

Fomes albogriseus is, I think, a small perfect example of Fomes officinalis (or Fomes laricis as you wish) but I am in doubt about it because I have not a very good knowledge of the latter plant. It was called Polyporus by Fries and put in the section with betulinus. The specimens I have, show distinctly the annual zones and I would class it as a Fomes though much softer context than Fomes in general. My specimens have no "crust" which is evident in Fomes albogriseus. Professor Peck's plant has externally the same shape and appearance as our common Fomes fomentarius, but the context which is soft and *pure white* suggests to me only officinalis.

No specimens of the six following are thought to exist in Professor Peck's collection. Some years ago the specimens were all moved to inadequate quarters in the Capitol building and some of them had to be boxed and stored. They are supposed to have been lost during this confusion.

Polyporus anceps
" Bartholomaei
" Burtii
" lactifluus
" Macouni
" perplexus

Polyporus Burtii from Peck's description is apparently too close to Polyporus adustus and Mr. Murrill has so referred it as a synonym.

Polyporus lactifluus is generally supposed to have been Berkeleyi but it is by no means certain that Berkeleyi "exudes freely a milky juice" even when young.[4] It was described by Professor Peck as having, globose, echinulate spores and Berkeleyi is the only American species known with such a character. Besides it agrees otherwise with Berkeleyi, except as to the "milk."

No specimens exist of Polyporus perplexus and Profesor Peck tells me he has never collected it but once. Polyporus cuticularis is a common plant, and has been familiar to Professor Peck for years, as it is to every other mycologist who collects fungi late in the season. It has almost always been known in American mycology as Polyporus cuticularis, and I believe without question correctly.[5]

After Professor Peck was familiar with the plant for years he made a collection that he thought was *not* this species and called it Polyporus perplexus. The specimens were lost, but Mr. Murrill claims that he can decide that the specimens he never saw, were the same as cuticularis (of American mycology) and that Professor Peck who did see them and decided that they were different was mistaken. Mr. Murrill must have had recourse to some occult science to reach such conclusions.

Our familiar Fomes that grow on acerous wood with flesh colored context called Fomes carneus and Fomes roseus are often held to be the same. I had about reached that conclusion, but in conversation with Professor Peck he tells me he thinks we have two species—one a thin plant (which he calls carneus) the other a thick, ungulated plant with a crust (which he calls roseus) and that he readily distinguishes them in the field. I place great value and reliance on field observations, and am glad that Professor Peck has called my attention to this. I had specimens from Professor Burt some years ago, and he at that time made a distinction between them.

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[4] The only reference I know as to any Polyporus exuding a milky juice is Mr. Murrill's statement "that it is a character possessed by other members of this genus." (Polyporus). It is unfortunate that the species are not specified as I think it is not a matter of general knowledge and I question if it is true.

[5] It is badly named and poorly figured by Bulliard, but the same plant grows in Europe and is known there to-day as Polyporus cuticularis. I have it from my European correspondents under this name and have collected it myself in France, and can find no difference worth mentioning between the European and American plants. They are exactly the same except a very slight difference in the spores (of the two specimens I compared. Both have elliptical, smooth, colored spores, in one 5-6 x 7 and in the other 4½-5 x 7. It would have shown poor judgment to have claimed that this constituted a specific difference, had it been known what the difference is.

A cover marked "early specimens" contains a number of corrections made by Professor Peck of his early determinations. As these names are part of the literature of American mycology and the corrections have not been published I append a list, with all of which I agree.

hirsutulus, 23rd Report, p. 83 = hirsutus
laceratus " " " 84 = pergamenus
Caroliniensis" " " 83 = biformis
Sullivantii " " " 84 = pubescens
cerifluus " " " 83 = borealis

Trametes piceinus is the same as Trametes abietis of Europe, and is, as generally held, a thin, conchoid form of Trametes pini. It is well worthy of a separate name, however.

Trametes abietis of Professor Peck's determination is in my opinion a trametoid form of Lenzites saepiaria, but Professor Peck does not agree with me in this instance. There is no record of this specimen being fragrant. It has a notation, "= Trametes odorata, fide Burt in Schweinitz's Herb," which is true, but the plant has no resemblance to Trametes odorata of Europe.

The plant determined as "Merulius Ravenelii, B. & C." is the same plant I have collected and frequently received from Europe, known there now on Bresadola's authority as "Poria taxicola, Pers. Poria rhodella, Fr. desc.! (not Icon. T. 189 f. 2)."[6]

I found in Professor Peck's collection a rare plant which was hitherto known in the United States only from a couple of collections in the Rocky Mountains, and called by Ellis, Polyporus alboluteus.[7] Professor Peck found it but once on spruce in the Adirondacks and recorded it (40th Rep.) as Lenzites sepiaria var. dentifera. His specimens are a subresupinate, irpecoid form and are the only collection known east of the Mississippi.

I learned a great deal during the two weeks I spent with Professor Peck, and am grateful for the information acquired and the courtesies extended to me.

CHANGE OF SEX.—A young lady in the East has recently discovered that Lactarius should be feminine, Lactaria, instead of masculine as mycologists for a hundred years have supposed. She probably thinks it is feminine because it gives milk.

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[6] As Bresadola puts an exclamation mark after Poria rhodella, I think it would have been better to have adopted that name. It appears to me there should be two doubtful marks put after Poria taxicola. One, because it has little resemblance to Persoon's figure. The other, because Persoon described it as "immarginatum" and the most prominent character is its broad, white margin. I would use a name after which I felt like placing an exclamation mark rather than a doubtful one however "prior" the latter may be.

[7] I hardly see how Ellis could have given it a worse name if he had tried, for it is neither "white" nor "yellow," but orange as Ellis described it. The young growth may possibly be white, but not when developed. Besides he originally put it in Fomes, of which genus it has not even a suggestion. I think these mistakes will all right themselves in time, however, for I believe it will prove to be a plant of Europe. This is an example of how the poor plants suffer from bad naming.

MYCOLOGICAL JOKES.—"I do not know what No. 3 are unless they prove to be puff balls. I found them near other puff balls, so send them along. They grew singly and in a group of three, glaring white, very viscid, white inside and intensely bitter to the slightest taste. They were one half larger than when dried. Found September 9th, 1906, on lawn." Specimens No. 3 are gelatin coated quinine pills. I at first thought my correspondent sent them as a catch for the purpose of tripping me, but am convinced now she was honestly mistaken in thinking they were "puff balls."

Another correspondent sent me a box of cigars, with the suggestion that they were probably a new species of phalloid, and wanted me to give them a name. I did not comply with the latter request, but I took pleasure in smoking the cigars.

Another sent me a candy specimen of Boletus, very life-like, and stated he was unable to determine it. I turned it over to my friend Professor McGinty, and he has named it "Boletus saccharinus McGinty, new species." I think the "diagnosis" has not yet been published.

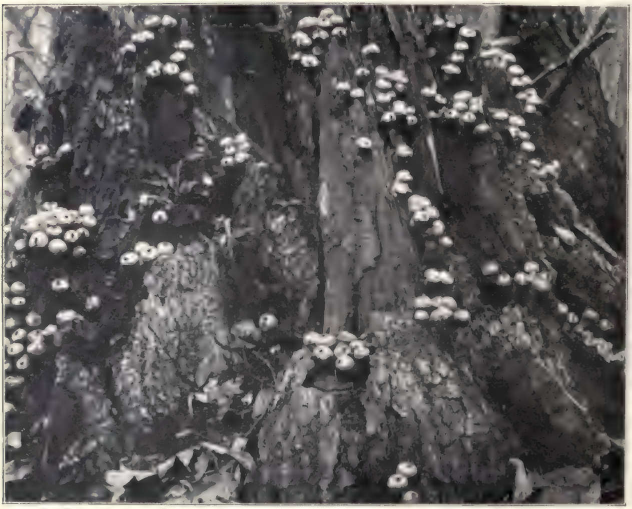

Fig. 195. LYCOPERDON PIRIFORME.

LYCOPERDON PIRIFORME.—We publish the above photograph from E. E. Bogue, Michigan, as it impresses us as representing unusually well the habits of the common Lycoperdon piriforme. You are pretty safe in referring the "puff balls" that you find growing in this manner on an old stump or log to Lycoperdon piriforme.

THE GENUS CYPELLOMYCES.—Professor Patouillard writes me: "I have read your note on the Cypellomyces. This genus is not different from Phellorina, and the figure given of the basidia and spores represents inaccurate observation."

As I stated in my review of the article, I do not believe any Gastromycetes produces spores such as Spegazzini shows. I can not see how the science of mycology is advanced by the production of these imaginary pictures for the purpose of bolstering up alleged "new species" and "new genera."

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 30.

CINCINNATI, O. FEBRUARY, 1908.

CONCERNING THE PHALLOIDS.

PHALLUS IRPICINUS (Plate 116, Fig. 4 and Fig. 211).—We have received a specimen of this plant in alcohol from Dr. Chas. Bernard, Buitenzorg, Java. It is a common plant in Java, but not known from other regions. We are quite well satisfied now that it is the same plant that Berkeley called Phallus merulinus.[1] In general appearance Phallus irpicinus conforms to others of the section of the genus Phallus with veils, but no other species is known with the same pileate structure. The external surface of the pileus (see fig. 211, which is an enlargement six diameters), is convoluted, and the gleba covers the interspaces between these folds.[2] This structure is somewhat similar to that of the genus Itajahya, and both might, with good reason be classed together as a genus, or put as a section of Phallus. The best account of Phallus irpicinus has been given by Penzig in his article on the Javanese phalloids.

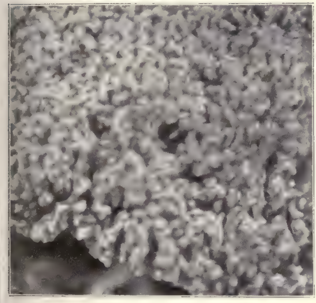

Fig. 211.

Pileus surface of Phallus irpicinus x 6.

CLATHRUS TREUBII (Fig. 212).—Dr. Charles Bernard, Buitenzorg, Java, favors us with an alcoholic specimen of his recently named species, and also a photograph of an unusually large specimen (which is reduced one-third). We have already given a figure

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[1] No specimen of Berkeley's exists, and he never formally "described" it, so I presume he will have to lose the name and the advertisement in connection with it. There is, however, no doubt about the truth. First, it is a common plant in Java, where Berkeley's specimen came from, and second, the phalloids of Java are well known, and no other species occurs there which conforms to his remarks,—"the reticulations of the pileus are gill-like and ochraceous head rivulose. It occurs at all seasons, and appears to be the most frequent." It is certain that Phallus merulinus is not a synonym for Phallus indusiatus, as stated by Fischer. Berkeley's name is a much better name than Phallus irpicinus, and for that reason might be taken, though not fully, in keeping with the latest rules.

[2] This is very much the same hymenium nature as the genus Merulius, and Berkeley's name, therefore, was not inapt. I can see no resemblance to the genus "Irpex," and consider the name very badly chosen.

UNIVERSITY OF CALIFORNIA

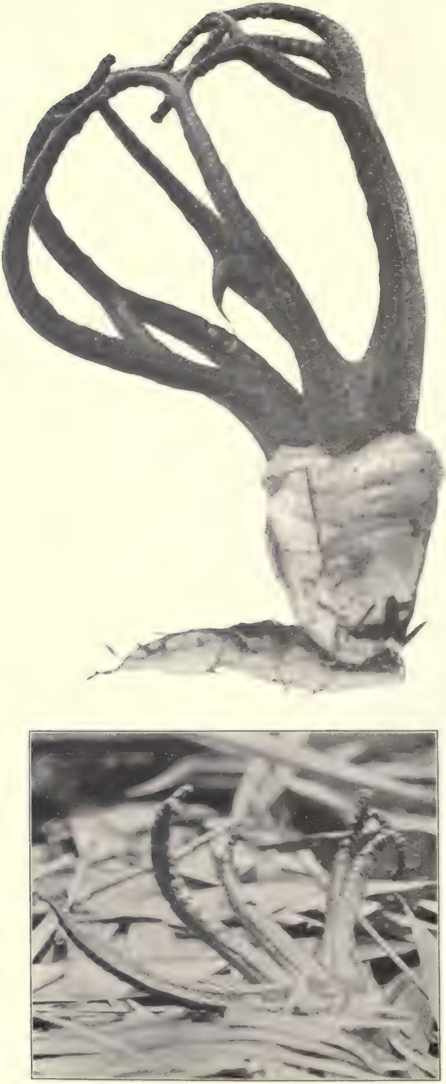

Fig. 212 -

CLATHRUS TREUBII.

The upper figure is a large specimen reduced one-third. The lower figure shows t manner in which the plant breaks up when old.

and account of this plant on page 334. It is a very distinct species with large meshes, and the primary arms somewhat columnal. It is known only from Java. Dr. Bernard also sends me a photograph illustrating the manner in which the old plants break up. The arms above in the clathrate portion are reduced in diameter, and in old specimens they break apart, and the primary arms separate. With the aid of photography Dr. Bernard has given us a perfect knowledge of this species.

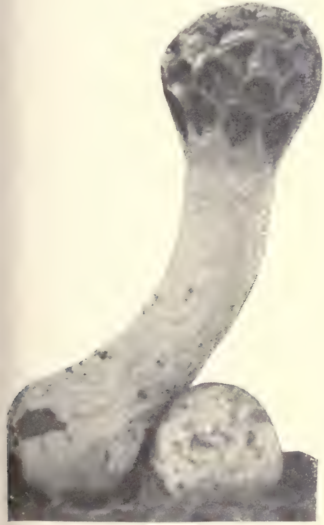

Fig. 213.
Simblum gracile
(Ceylon)

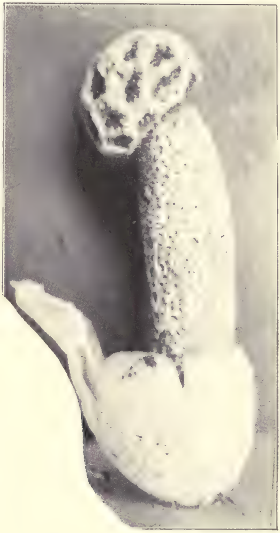

Fig. 214.
Simblum Texense
(Texas

SIMBLUM GRACILE (Fig 213).—We are glad to present a photograph of Simblum gracile received from Dr. Charles Bernard, Java. It is a common and well known plant in Java and has been well illustrated by Penzig. The species is of particular interest to us in the United States because the question has been raised as to whether it is the same as our American species Simblum Texense. I am satisfied now it is quite distinct, for all of the Javanese illustrations show a globose head contracted into the stem, and different meshes from our American plant. The difference will be better appreciated by comparing Dr. Bernard's figure (Fig. 213) with that from Professor Long, (Fig. 214). Little is known about the original species, Simblum periphragmoides of Mauritius[1] but Hooker's figure, which is well borne out by the specimen now at Kew, differs very much from both of these species, and I think we have three yellow Simblums quite distinct and worthy of names. Simblum flavescens as illustrated by Berkeley from a colored figure by Kurtz (now to be found at Kew) is I think the same as Simblum gracile.

THAT RED LYSURUS.—Mr. Harold Murray, of the Manchester Museum, of Manchester, England, writes me that the red Lysurus that he found is really white, merely having red arms. Mr. Murray is disposed to refer it to Lysurus Clarazianus of South America. I suspect if we really knew the truth about the matter all "species" of described Lysurus (except L. Mokusin) would be found to be very much the same thing.

COLUS HIRUDINOSUS (Figs. 215 and 216).—Thanks to Rev. C. Torrend, who sent us alcoholic material, we are enabled to give photographs and enlargements of this phalloid. We have always felt that the familiar figure of Tulasne, usually reproduced, does not represent this plant as well as does the most of Tulasne's work, and the original cut by Cavalier was very poor. As will be seen from the figure, Colus hirudinosus is a clathrate plant, the clathrate receptacles being supported on columns which are reunited at the base into a stipe. Rev. Torrend informs me that he finds specimens almost devoid of a stipe and suggests that the plant might be classed as a Clathrus. It is a small phalloid, our figure 216 representing the natural size of the specimens received in alcohol. The color is bright red and the plant is said to be very slightly foetid. We think our photographs will tell the rest of the story.

HISTORY AND DISTRIBUTION.—Colus hirudinosus is only known from the Mediterranean regions[2]. It was first collected in Corsica by a man named Soleirol, in 1820, who sent the specimens to Montagne and the specimens are now in Montagne's herbarium, labeled in his writing—"Clathrus hirudinosus Nobis". It was published by Cavalier and Séchier fifteen years later under the name Colus hirudinosus[3] from specimens that were collected in the vicinity of Toulon, France. Father Torrend finds it, not infrequently, in the vicinity of Lisbon, Portugal. It is known from the Maritime Alps and the Pyrenees and from Algeria and as previously stated was first collected in Corsica. The orig-

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[1] It is evidently a rare plant in Mauritius and Chas. O'Connor who is now observing the fungi of Mauritius has not as yet found it.

[2] Notwithstanding that Cooke copied Tulasne's figure and included it in the Australian Handbook there is no evidence that the plant ever grew in Australia.

[3] While the plant is advertised as "Cavalier and Séchier" it is evident to me it should bear the trade name of "Montagne" Cavalier and Sechier were local men who undoubtedly got all their information from Montagne and the fact that they used the specific name on Montagne's specimen was surely not a mere coincidence. They did not mention Montagne in their article but took all the credit ? to themselves which, however, is customary in such conditions.

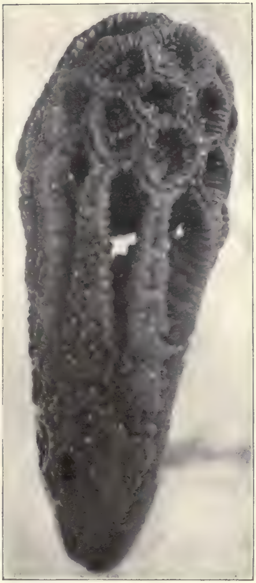

Fig. 215.

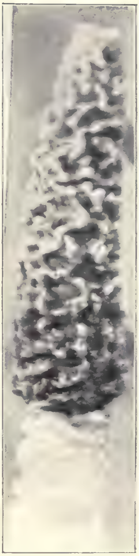

Fig. 217.

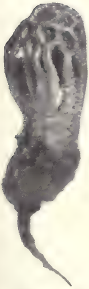

Fig. 216

Fig. 218.

Fig. 216. Colus hirudinosus, natural size.
Fig. 215. Same without volva, enlarged x 4.
Fig. 218. Jansia rugosa, natural size:
Fig. 217. Same, pileus enlarged x 6.

inal collectors found it only on manure[3] but Father Torrend advises me he does not find it in such situations, but in the sand.

LYSURUS BOREALIS.—We have received a beautiful, large dried specimen of this phalloid from Mr. Geo. B. Fessenden, of Boston. We present a photograph of it (Fig. 219), in order to show what can be done in drying phalloids if they are carefully dried. We believe everything can be learned from this specimen of Mr. Fessenden's that could be learned from the growing plant, particularly as he favors us with a memorandum of its colors when fresh. Mr. Fessenden's specimen convinces us pretty thoroughly of the correctness of the opinion we have previously taken that the species of Lysurus originally from Ceylon, called Lysurus Gardneri, and then from Australia, called Anthurus australiensis, and then from this country, called Anthurus borealis, are all one and the same plant.

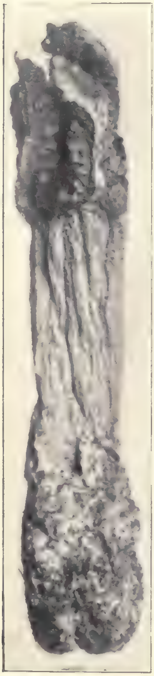

Fig. 219.

Lysurus borealis (from dried specimen).

MUTINUS ELEGANS.—Mr. C. C. Hanmer, of Connecticut, has forwarded us some eggs of Mutinus elegans in a younger condition than the section we showed in our Plate 93. The disposition of the gleba in the very young egg is different from what we had supposed. It is a thick layer surrounding the upper portion of the young stipe, as shown in Fig. 220, made from Mr. Hanmer's specimen. At a later stage the stem elongates and pushes up through the gleba, as shown in Fig. 221, which was made from the egg of the same species in a later state.

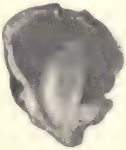

Fig. 220.

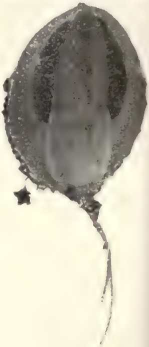

Fig. 221.

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[3] We stated in our "Phalloids of Australasia" that it "grows only on manure", which it develops is erroneous. We had this impression from the notes of the original collector Soleirol who stated that it differs from Clathrus cancellatus in its habitat. He found it in Corsica originally, only "sur les bouses de vaches" and later specimens he sent were "sur les fientes d'animaux".

PHALLUS DUPLICATUS OF MAURITIUS.—Those who have compared our figures 222 and 223, originally printed on page 371 of Mycological Notes, may reasonably question if they represent the same species. One of the problems constantly confronting the systematist is, what amount of variation may be allowed the same species. We should be better able to judge of this matter if we had abundant collections of phalloids from the tropics, and could compare the reticulations of the pilei. However, we would rather err on the side of liberality than of narrowness in the consideration of species. There is no more difference in the reticulations of the Mauritius form and the American form that we have called Phallus duplicatus than there is in the illustrations of Phallus indusiatus, as shown in Moeller's photographs from Brazil, and Mr. Moeller states he finds *there* all connecting forms. The pileus of Mr. O'Conner's species, Fig. 222, is very similar to that represented by Penzig as a phalloid from Java, which he called Phallus favosus, but that species has no veil. The Mauritius form does not have as strong an apical collar as the American, and it perhaps would have been better to have given it a separate name to indicate this form.

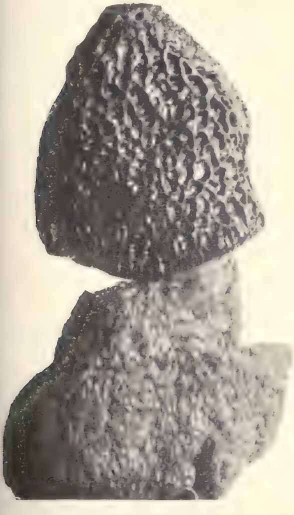

Fig. 222.

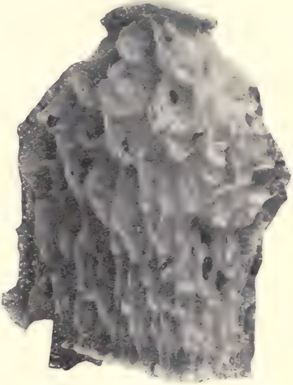

Fig 223.

JANSIA RUGOSA (Fig. 218 and Fig. 217 enlarged six diameters).—In a fine lot of alcoholic phalloids that Dr. Bernard sent us from Java is a specimen of Jansia rugosa which was so beautifully illustrated by Penzig. The genus Jansia is very similar to the genus Mutinus, but the gleba-bearing portion differs markedly from the stipe, being more of the nature of a pileus at the apex of the stipe. In this species as will be seen from our enlargement (Fig. 217) it is strongly rugulose and the plant is well named.[1] There are two species of Jansia in Java, as fully brought out in Penzig's paper. Both are very small plants and the other species Jansia elegans is less frequent. (See Figures on page 385).

HISTORY.—There is no question, as Fischer has learned from examination of the types at Berlin, but that this is the same plant as called Floccomutinus Nymanianus and poorly illustrated. As both the name and the work were poor we prefer to adopt the better work done by Penzig. Whether or not the genus Jansia is the same as the genus Floccomutinus, it is difficult to decide from the original figure and description of the latter genus. From Fischer's work they seem to me distinct. There is another alleged species by Cesati from Borneo, Mutinus borneensis, which I suspect will eventually prove to be the same as Jansia rugosa.

TORRENDIA PULCHELLA.

We are pleased to give figures, illustrating this unique genus, which are made from alcoholic material received from Rev. C. Torrend, Portugal. The genus Torrendia is something out of the ordinary and is widely removed from all previously known Gastromycetes. It is a fleshy plant most nearly related I think to the Hymenogasters, but with the general appearance (see Fig. 224) of a little Amanita. It is enclosed in a volva when young that in the mature plant remains as a cup at the base. The stem lengthens as the plant develops from the egg and is entirely distinct from the pileus. The pileus is a convex hemispherical cap of a soft, fleshy nature, homogeneous to the eye, but under the microscope is seen to consist of chambers filled with hyaline spores. The spores (Fig. 225) are narrowly elliptical, hyaline, smooth, with granular contents and measure about 6 x 16 mic. The entire plant is pure white and the size is shown in our Fig. 224.

HISTORY AND DISTRIBUTION.—There is but one species, Torrendia pulchella, known and it was described in 1901. It grows in the sand and has only been collected by its discoverer, Rev. C. Torrend, in Portugal. It has no very close relations to any other known plant, differing from most Gastromycetes in not having pulverulent spores; from all phalloids in the permanent chambers of the pileus; and from the Hymenogasters entirely in its pileate nature. Being restricted as far as known to the Iberian peninsula it is very appropriately named after Rev. C. Torrend who has done so much to make known the mycology of this region.

WANTED EGGS.—Should any of my friends find the undeveloped eggs of Lysurus borealis (or Anthurus borealis as often called) I hope they will do me the favor to send me a few in formalin or alcohol. I should like to "study the structure".

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[1] That is specifically. Generically it was named after a local botanist of Java. Dr. Penzig missed an opportunity when he did not name the genus after the phaenogamic genus Piper of the tropics, for the gleba-bearing portion has the same general appearance as the fruit of the genus Piper, and it would have been a most excellent name for it.

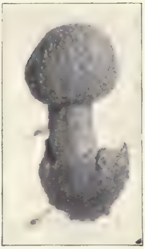

Fig. 224.

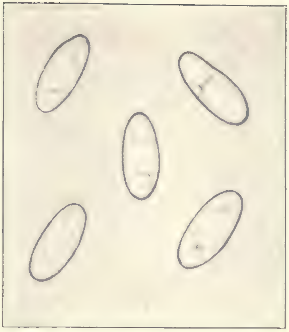

Fig. 225.

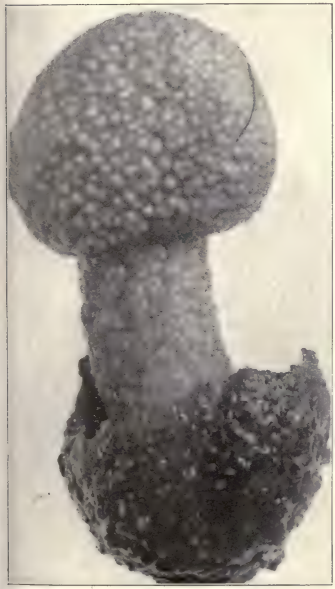

Fig. 226.

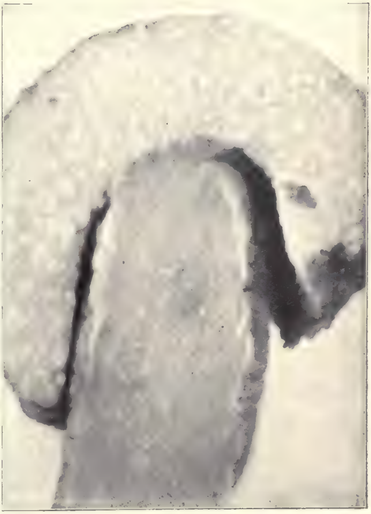

Fig. 227.

TORRENDIA PULCHELLA.

Fig. 224 natural size.　　Fig. 225 Spores (x 1000.)

Fig. 226 enlarged x 4.　　Fig. 227, section enlarged x 6.

THE GENUS MATULA.

There has been a very bad muddle made with reference to the genus Matula, as found in the latest text-books, Saccardo, and Engler and Prantl. This can be traced originally to ambiguous work on the part of Berkeley. The genus Matula is a curious genus, closest, I think, to the Nidulariaceae. It consists of little cup-shaped plants, looking superficially like a little Peziza. The color is white, or pale, and the texture, when dry, is rather hard and horny, though when fresh and moist is said to be somewhat gelatinous. The spores are very numerous, and seem to fill almost the entire interior of the plant. They are contained in cells or chambers, and the walls of the chambers in the plants partially persist and partially disappear. Fig. 229 is by Massee, showing his idea of an enlarged cross section of a cup. I do not know the method of dehiscence, but Father Rick, in one of his letters to me, mentions it. I have never seen a plant that had opened. The spores remind me of those of the large-spored species of Cyathus. They are perfectly globose, 18 to 20 mic., hyaline with thick spore walls (about 3 mic.). They do not appear to me to be basidial spores (neither do Cyathus spores, cfr. Nidulariaceae, p. 6). Mr. Petch, of Ceylon, who has studied their development writes me that they are borne singly on side branches of indefinite, long hyphae, with nothing resembling a basidia.[1] They seemed to be packed very densely in the chambers of the plant.

RELATIONS.—The relations appear to be entirely with the Nidulariaceae. The spores are the same, but are contained in chambers in the tissue, not in separate peridioles. The structure is very much like that of Torrendia. The genus has no relations to the Thelephoraceae, where it is placed (in a foot note) in Saccardo.

HISTORY.—When Berkeley wrote on the plants of Cuba, he established a genus Michenera in the Thelephoraceae, and called the species Michenera Artocreas.[2] It had peculiar "lemon-shaped" large spores, borne, of course, on the surface (and now demonstrated to be conidial spores). The genus Matula, Berkeley first received from Ceylon, and he made a new genus for it, Artocreas, and called the plant Artocreas poroniaeformis. It had the spores in cells in the interior of the plant, as Berkeley knew, for there is a sketch (by Broome) showing such structure with the type specimen. Berkeley made no reference to it, however, and states "a species of the same very distinct genus, Artocreas Micheneri, occurs in the United States." As Artocreas Micheneri appears to be simply a transposition of the previously published Michenera Artocreas, it has been usually assumed that the genus Artocreas was an inadvertent publication, and that Berkeley intended to write Michenera,[3] hence the Ceylonese species is included in Michenera in Saccardo and Engler and Prantl, though it has not the slightest structural relation to it. Massee afterwards brought out the genus Matula,[4] and gave full account of its structure, basing it on the Ceylonese species. Saccardo compiled it in a foot note under the Thelephoraceae, which is rather a strange proceeding, if he believes Massee's account. I do not see any grounds for not taking the genus Matula, unless it should develop that the genus does grow in the United States, and that Artocreas Micheneri is different from Michenera Artocreas.

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[1] When the genus Matula was established it was said to have basidia, in fact, a picture was shown of them. I am afraid a good deal of such work is largely made up, and I would personally prefer to rely on the observations of Mr. Petch. It is a subject, however, I know nothing about.

[2] "The genus Michenera, as far as the type species (M. Artocreas) at least is concerned, can not be accepted. Michenera Artocreas, as shown by culture, is undoubtedly merely a conidial form of a Corticium, probably C. subgiganteum."—W. G. FARLOW.

[3] I had that impression myself when I was at Kew, and did not investigate as closely as I should have done. When I look the subject up now I note that Berkeley does not cite the same collection numbers for Artocreas Micheneri that he does for Michenera Artocreas.

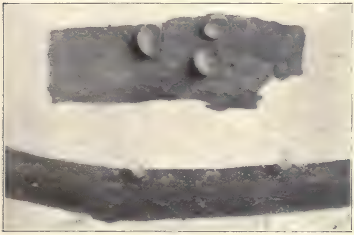

Fig. 228.

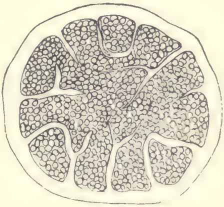

Fig. 229

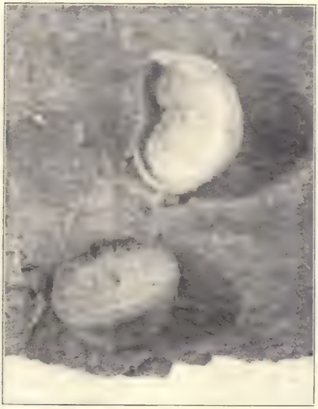

Fig. 230.

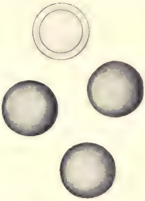

Fig. 231.

THE GENUS MATULA.

Fig. 228, plants natural size.
Fig. 229, section of cup enlarged, from Massee.
Fig. 230, cups enlarged x 6.
Fig. 231, spores and section enlarged x 500.

SPECIES.—There have been two species of Matula proposed (assuming that the plant called Artocreas Micheneri from the United States is the same as Michenera Artocreas of Cuba). These are Matula poroniaeformis of Ceylon and Matula Rompelii of Brazil (published as Michenera Rompelii). From the relatively scanty material that I have I can not say whether they are the same or not, but they are very close. They have the same shape, color, size, structure and spores.[5] The only difference I can note is that the Ceylonese plant has a thicker cup, over two mm. thick, while my specimens from Brazil are a scant mm. thick. I am inclined to think that in time they will prove to be exactly the same plant.[6]

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[4] The name is more appropriate than elegant.

LIGHT ON BOVISTA TOMENTOSA.

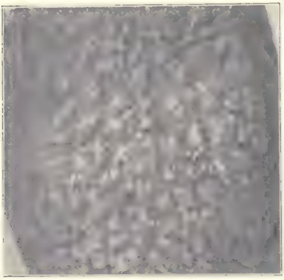

Fig. 232.

Cortex of Bovista tomentosa enlarged, x 6.

Ever since we began work with the puff balls, there has always been one species of Europe that was a mystery to us. This is Bovista tomentosa, as illustrated by Vittadini and Quèlet, (cfr. page 263). We have never seen any Bovista from Europe with a *tomentose* cortex, but we have always had faith in Vittadini's work, as we have worked after him enough to know there was something back of everything he wrote, and that Vittadini did not belong to that class of mycologists who imagine things. We believe that light has been thrown on Bovista tomentosa from specimens *received from Australia.* It is a long ways to go to hunt up evidence as to European plants. The genus Bovista is a rare genus in Australia, strange to say, and neither of the common species of Europe and America, Bovista plumbea, nigrescens and Pila, is known to occur there. I found at Kew a single collection of a Bovista from New Zealand named by Berkeley, Bovista brunnea. It had a smooth peridium, and was well named brunnea, as its chief distinction from the common Bovista plumbea of Europe seemed to be that the peridium *was brown.* Then we received a specimen from some unknown friend in New Zealand, and then the same *brown* species from two European correspondents (Professor C. Massalongo, Italy, and Professor Jos. Rompel, Switzerland). We referred the European collections to the New Zealand species. Plants since received from Walter W. Froggatt and also Walter Gills, Australia, are this same *brown* species, but both are accompanied by young specimens and the cortex is composed of small spines (might be called tomentose) and it is the only true Bovista that does not have a *smooth* cortex. (See Fig. 232, enlarged x 6.) We feel that this is a solution of the Bovista tomentosa puzzle of Europe and that Bovista brunnea is an old specimen of Bovista tomentosa. I ought to add that Dr. Hóllos has gotten the matter right as far as the European species is concerned and that Fuckel's Exsic. No. 1884, belongs here as he states, but I take no stock in his reference of the American species, Bovista minor and Bovistella dealbata, to the same species.

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[5] The spores of both species are unusually uniform in size, a scant 20 mic., and a little smaller, not more than one or two microns in the Brazilian plant. In the type specimens I do not find any spores over 20 mic., and the measurement, "24–28 mic.," is too large.

[6] When Father Rick found the spores of his plant to be scarcely 20 mic. in diameter, he was justified in not referring it to the Ceylonese species, described as having spores "24–28 mic." But like many so-called "new species," it will develop, I think, that it was based simply on the error of the "old species."

A MAMMOTH FORM OF LYCOPERDON PULCHERRIMUM.

What would undoubtedly have been a "new species", had it been sent separately, was received from E. Bartholomew, Stockton, Kansas. It was a large, turbinate plant (See Fig. 233) more of the shape of a Calvatia than of any Lycoperdon of our eastern states. It had exactly the same cortex, gleba color, capillitium and spores as Lycoperdon pulcherrimum and was accompanied by smaller plants that are exactly our usual form of this species. We, therefore, have to refer it to our eastern species, but if sent alone it would have been a good "new species". Shape and size do not seem to count for much in the puff balls, and our species develop more luxuriant forms in the west than in our eastern states.

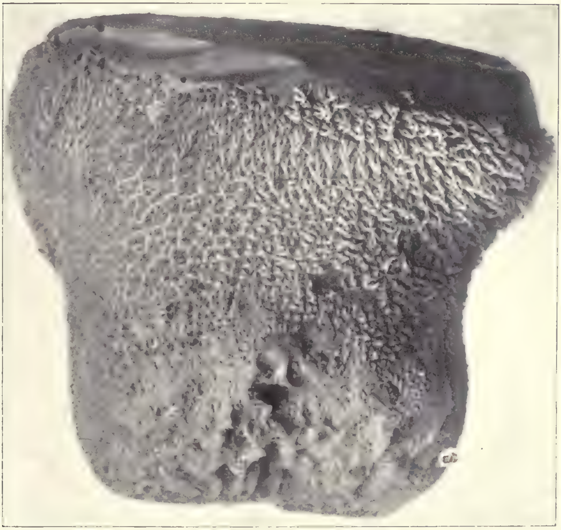

Fig. 233.
Lycoperdon pulcherrimum (mammoth form

POLYSACCUM ALBUM.

When I examined the types of this species, which are small, smooth and white, I thought it was a young specimen of Polysaccum pisocarpium, and have so referred it (Lyc. of Aus., p. 12). I have just received from R. T. Baker, Sydney, Australia, two fine specimens (Fig. 234) which are mature, and appear to me as being different from the European plant, hence I conclude that Polysaccum album is a good species as "species" of Polysaccum run. While it is so close to P. pisocarpium that it is difficult to explain the difference, Mr. Baker's specimens are white, smooth and firm. When fresh I think they are especially liable to discoloration if bruised, and the tissue paper in which they are wrapped is stained, and the specimens are spotted black, evidently where bruised. It is probable that Polysaccum marmoratum is based on this character which all "species" of Polysaccum seem to have, of spotting when bruised. The "type" specimens of marmoratum are rather the shape of crassipes than that of pisocarpium. The genus Polysaccum consists in reality of one polymorphic species, and it is a simple matter to so designate it and dump all the specific names into one. Different collections, however, differ so much from each other that this treatment will not satisfy the average systematist who would separate the marked forms. But unless his experience is limited, he will be embarrassed to definitely refer to these forms or "species" the specimens he examines. Contrasting Mr. Baker's specimen with the usual collection of Polysaccum pisocarpium, it differs markedly in its smooth, white peridium, and is hence a good "species" as far as any species of Polysaccum are "good."

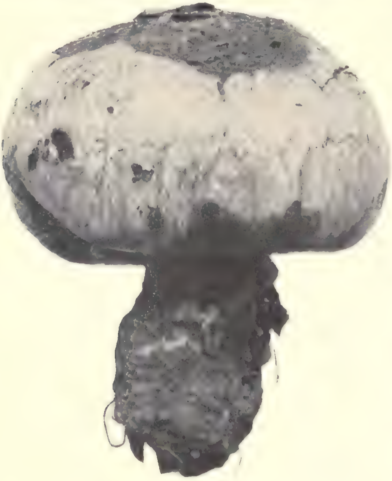

Fig. 234.

LETTERS.—The Letters we have issued from time to time are principally reports of specimens received and are not sent to our regular mailing list. We have sent them chiefly to those whose names appear in the reports of plants in each letter. However, those desiring to complete sets for binding can secure these Letters by sending request to the Lloyd Library, No. 224 West Court Street, Cincinnati, Ohio, specifying the numbers missing from their sets. We have just reprinted Letter No. 1, and can at present supply any of the back numbers. Nineteen Letters have been issued to date.

THE GASTROMYCETES OF SCHWEINITZ'S HERBARIUM.

During a recent visit I made to Schweinitz's herbarium, I studied his specimens of Gastromycetes very carefully with reference to his published determinations. I had previously worked with them, but it was when I first began with the Gastromycetes, and I feel in much better position to pass on them now than at the time of my former visit.

The following is a complete account of the specimens preserved in the herbarium, using the names as found in Schweinitz's published list:

Of the phalloids, only Phallus indusiatus and Phallus duplicatus exist. Both are in too poor a condition to pass an opinion on, but a veil can only be plainly seen on the former.

Tuber cibarium is only represented by a fragment from Europe.

Rhizopogon albus is Rhizopogon luteolus. Rhizopogon virens is very scantily represented, and Rhizopogon aestivus is probably not a Rhizopogon.

Nidularia striata is Cyathus striatus. Nidularia campanulata, Nidularia Crucibulum, Nidularia juglandicola, and Nidularia scutellaris are all the same plant—Crucibulum vulgare. Nidularia stercorea, Nidularia melanosperma, and Nidularia rugisperma are all Cyathus stercoreus. Nidularia fascicularis is Cyathus vernicosus. There are no specimens of Nidularia pulvinata in the collection but one from Lusatia (labeled Nidularia farcta), which is, without doubt, the same thing, viz.: Nidularia pisiformis.

Arachnion album, a nice type, as now well known.

The next thirteen species in Schweinitz's list, with the exception of Sphaerobolus stellatus (which is correct), are none of them nowadays held to belong to the Gastromycetes. Only half of them are now represented in the herbarium.

Elaphomyces cervinum and Scleroderma spadiceum are both Elaphomyces, I judge, but as to the species I can not say, as I am not informed as to the Tuberaceae.

Scleroderma citrinum and Scleroderma verrucosum are both Scleroderma aurantium. Scleroderma Cepa and Scleroderma polyrhizon are both Scleroderma Cepa. Scleroderma Lycoperdioides is not represented, and I have always suspected, from the description, that it is the common species which we now know as Scleroderma tenerum. As I become more familiar with this species, I am more convinced that it was the plant Schweinitz had, but unfortunately there is no specimen to confirm it.

"Uperrhiza Boscii" — there is no specimen. I think no one knows what plant Bosc figured under the name.

Mitremyces lutescens—there are four specimens on the sheet. One, a young specimen, full of spores; the other three have the peridia broken away, and are little more than rooting bases. The young specimen is, externally, typically Mitremyces Ravenelii, and the spores confirm it. On scraping the broken plants, I obtained the same oblong spores, and I am assured now that the plants are all Mitremyces Ravenelii. Schweinitz was so clear in his writings that I can not but feel he had a correct knowledge of Mitremyces lutescens, notwithstanding the contradictory evidence of his herbarium, and, it will readily be seen, that I would have good grounds to juggle the accepted definitions of the Mitremyces species on the evidence of Schweinitz's herbarium, if I were so disposed. Mitremyces cinnabarinus is typically that plant.

Actinodermium Sterrebeckii is Scleroderma Geaster.

Geaster pectinatus is doubtfully correct. The endoperidium is not enough pedicellate. More probably, I think it is an old specimen of Geaster Archeri, the exoperidium reflexed, the fleshy layer gone, so as to give the endoperidium a subpedicellate effect. Geaster quadrifidus is Geaster coronatus, a large specimen, and a rare plant in the United States. Geaster minimus is the type of this well-known species; Geaster rufescens is as we now know it. Geaster hygrometricus and Geaster fibrillosus are both the former.

Bovista gigantea is wrong. It has lilac spores, and is Calvatia lilacina. Bovista craniiformis is Calvatia craniiformis, as now known. Professor Morgan told me that before adopting the specific name he sent a plant to Philadelphia and had it compared with Schweinitz's type. Bovista nigrescens is Bovista Pila. Schweinitz could hardly have been expected to distinguish between these two species, as it is solely a microscopic spore difference. Bovista nigrescens is not known to occur in the United States. Bovista plumbea has the general, external appearance of being correct, and I think I so passed it on my previous visit. The microscope shows, however, that it has entirely different capillitium and spores, and is an immature Catastoma, the same species as the next. Bovista candida is Catastoma circumscissum, as now known. This plant, and its larger-spored form, have been taken to be a new species at least a dozen times, and including the juggled ones, has probably twenty different names. Schweinitz's name, candida, is the earliest one I have thus far succeeded in unearthing.[1]

Lycoperdon pratense is not in good condition, but is, I think, old decorticated specimen of Lycoperdon cruciatum. Lycoperdon echinatum, from its white spines, is Lycoperdon pulcherrimum. Lycoperdon piriforme is correct, and also Lycoperdon quercinum is a form of it. Lycoperdon excipuliforme and Lycoperdon perlatum are both Lycoperdon gemmatum. Lycoperdon utriforme is too fragmentary to name.

Tylostoma brumale and Tylostoma squamosum. It would be hazardous to pass an opinion on such specimens as these. The former is too large to be typical of the European plant (mammosum).

The remainder of Schweinitz's Gastromycetes are all Myxomycetes, hence do not fall in my line of work.

DO YOU KNOW A FETID PUFF BALL?—I am told by Rev. J. Rick (now in Brazil) that he once collected in Holland a Lycoperdon that was *truly fetid* when fresh. We know that Bonorden described a Lycoperdon foetidum, but he found so many new species that no one else ever found that we have not placed much stress on any of his "finds." Rev. Rick's observations, however, can be relied upon, and I hope mycologists in Europe will be on the lookout for a *fetid* puff ball.

LATIN TERMS.—In our work on the Nidulariaceae we used several Latin words where the English would have been better. Thus, "funiculus" for funicule, "tunica" for tunic. We did not do this to show the little Latin we may know, as we do not question that we show how little that is quite frequently without intention. We wrote the article at Paris, out of touch with English dictionaries and our reference works (Tulasne and Saccardo) were in Latin. We did not know what the corresponding English words were for these terms, nor in fact if there were any.

THE "CAPILLITIUM" OF NIDULARIACEAE.—None of the Nidulariaceae have capillitium, although it has been a tradition of the subject ever since De Toni mis-read Tulasne's account and defined Cyathus as having "sporae filamentis immixtae". Dr. Hóllos on Plate 28 shows spores and "capillitium" of several species. What he takes for capillitium is the hyaline, nodular strands of the funiculus, and have the same relation to capillitium that a kite string has to the frame work of a kite. You must not believe everything you see in print, nor all the pictures, even if they are put forth as "science".

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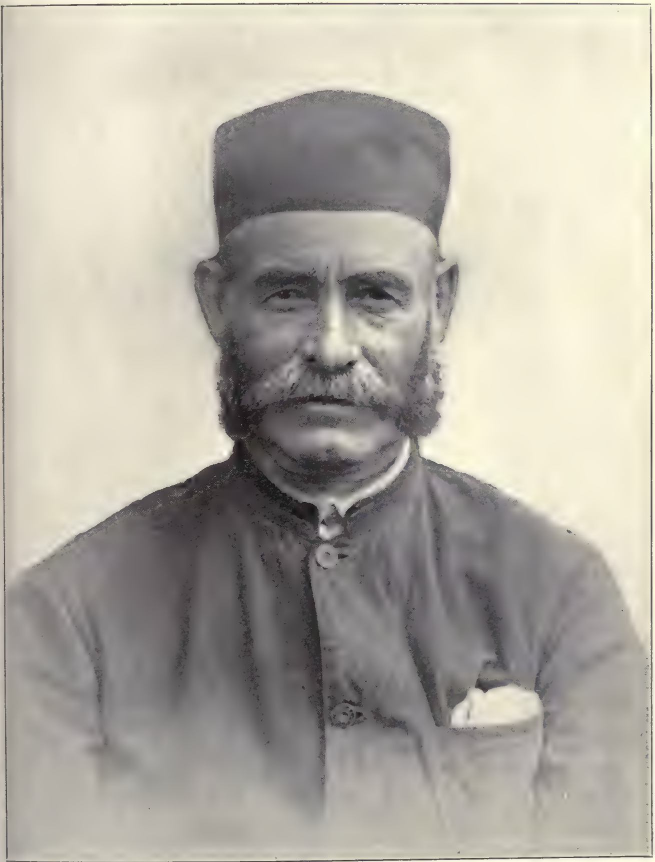
[1] Professor McGinty writes me that he calls it "Catastoma candidum Schw. McGinty," or "Disciceda candidum (Schw. McGinty," depending on whether he is writing for American or European jugglers.

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

No. 31.

CINCINNATI, O. AUGUST, 1908.



Professor A. P. Morgan.

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

PROFESSOR A. P. MORGAN.

As we look back over the past few years, it is appalling to consider the inroads that have been made among our American mycologists by death. First we lost J. B. Ellis, then Dr. Wm. Herbst, then Professor A. P. Morgan, then Professor L. M. Underwood, and finally W. A. Kellerman. We hope to present photographs of all these mycologists in the next few issues of Mycological Notes.

Professor Morgan was indeed a good friend of mine, and it was he who first gave me an introduction to the study of mycology. He resided at Preston, Ohio, which was only a short distance from Cincinnati, and many pleasant visits I have made to his home. He was very much of a philosopher, and pursued the study of mycology solely as a mental recreation. Years ago, before I knew him, he was interested in educational work, but his health failed under the strain and he very wisely put aside the strenuous life, and retired to a small farm for rest. His mind was too bright to rust out, and he found his pleasure in studying the secrets of Nature. He was somewhat hampered in the pursuit of his studies of fungi by a scanty library and the lack of museum facilities, but he accomplished more in his practical isolation than most men have done under most favorable conditions. His first good work was with the Gastromycetes, and he was really the first one who made a close study of them. He established a number of genera, all of them based on the best structural grounds, and they were permanent additions to the knowledge of the subject. In my work with the Gastromycetes, I have worked after no one who displayed a keener insight into the correct principles of classification of these plants. After he had finished the Gastromycetes, he took up the Myxomycetes, but as to the merits of his work with this family, I am not competent to say.

The portrait we present is an amateur production, taken by myself, and shows Professor Morgan just as I found him in his working garb. As far as I know, there is no other recent photograph of him excepting the one which was published by Professor Kellerman, which was likewise an amateur portrait.

MILK IN POLYPORUS.

In a footnote I have expressed a doubt of any Polyporus being supplied with milk. Mr. P. L. Ricker, of Washington, D. C., has kindly advised me that he finds milk in the Polyporus, generally known as Polyporus resinosus. It is a well known fact that this plant distills drops of liquids when young as do other polyporoids, such as Polyporus cuticularis and particularly Polyporus dryadeus. However, the drops are aqueous and have no suggestion of milk. Mr. Ricker states that when the young plant is broken a milky juice always appears. I am not entirely convinced, but take pleasure in putting Mr. Ricker's observation on record, and the next time I find young specimens I shall do a little investigating.

RESIDENCE OF THE LATE A. P. MORGAN

THE PHALLOIDS OF JAPAN.

In the beginning we wish to acknowledge our indebtedness to the following gentlemen for notes, drawings and photographs from which this article is written.

Professor Kusano for seven colored drawings and specimens in alcohol, also (Fig. 242) a photograph which we reproduce of Laternea bicolumnata.

Professor M. Gono, for notes and two colored drawings.

Professor A. Yasuda, for notes and published plates of two species.

KEY TO THE GENERA.

1st. The simple stem section. Gleba borne on a pileus on top of a simple stem	Phallus
Gleba borne directly on the upper portion of a simple stem	Mutinus
2d. The lobed section. Gleba borne on free arms at top of a simple stem	Lysurus
3d. The columnar section. Receptacle consisting of simple, vertical columns united at the top	Laternea

In the following list of the seven phalloids—all that are certainly known to us to grow in Japan—we give the Latin name and follow it by the Japanese name. The latter we have taken from Matsumura's list or from the notes of our correspondents. In some cases we suspect these Japanese names have been switched. Thus, it is strange that Phallus rugulosus should have two common names, and Phallus impudicus, a more common and larger species, should have none. We should consider it a favor if our Japanese readers will advise us of any errors as to these common names or of other mistakes that may occur in this account.

PHALLUS INDUSIATUS.—Komusō-take; Kinugasa-take; Sikedake. Pileus broadly campanulate, rather faintly reticulate, furnished with a permanent apical collar, color dark; veil (indusium) protruding from under the pileus and surrounding the stem, consisting of a fine network, color white; stipe white.

History.—Phallus indusiatus is a frequent plant in many warm countries. It can be known at once among the Japanese species by its strongly developed veil. It is recorded in Matsumura's list as Dictyophora phalloidea from Tokio, but the authority for it is not stated. I have a colored figure of it from Professor Gono of Iyo. The typical form of Phallus indusiatus usually occurs in warm countries, and Professor Gono's figure is typical of the type form. In America, in the more temperate regions, it takes a slightly different form, called Phallus duplicatus. As we have seen no figure of the form from Tokio, we can not say as to which it should be referred.

PHALLUS IMPUDICUS.—Pileus rather narrowly campanulate, strongly reticulate with a strong apical collar, color dark; veil none or only rudimentary; stipe white.

History.—Phallus impudicus is the original phalloid known from Europe where it is very common. In the United States it is much more rare, and takes with us only a pink form known as Phallus imperialis. It occurs in Matsumura's

JAPANESE PHALLOIDS.

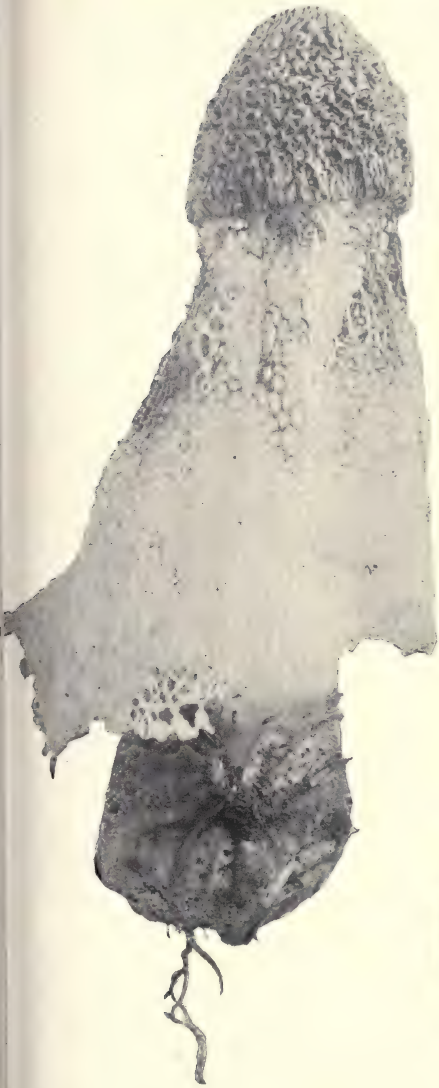


Fig. 236.
Phallus indusiatus.

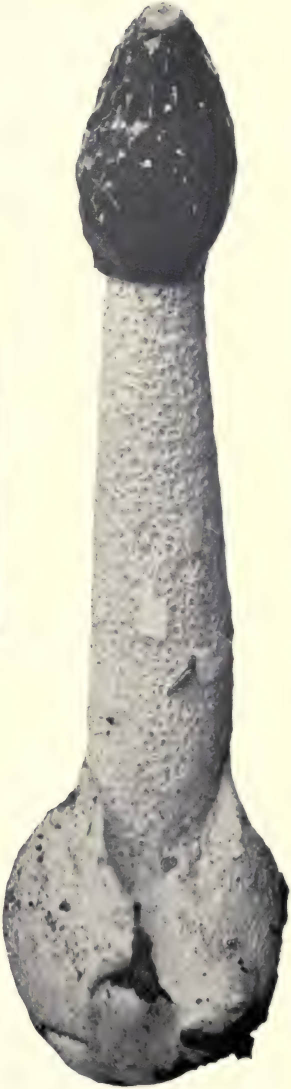


Fig. 237
Phallus impudicus.

list as Ithyphallus impudicus ("Linnaeus) Fries,"[1] from Tokyo. Professor Yasuda has published a good figure of it in "Cryptogamae Japonicae Iconibus Illustratae" (plate 70). Phallus impudicus can be readily recognized among the Japanese species by its strongly reticulate pileus and the absence of a veil. Professor Kusano sends me a drawing from which I judge the Japanese plant is almost identical with the type form of Europe, and he states it is a very common species in Japan.

PHALLUS RUGULOSUS.—Kitsune-no-efude, Kitsune-no-egakifude. Pileus narrowly campanulate or thimble-shaped, almost even or slightly rugulose with a small, globose, apical collar; color dark; veil none; stem reddish.

History.—Phallus rugulosus is described by Professor Fischer from Japanese specimens and is known only from Japan. It is similar to Phallus impudicus in its colorings, but it is a much smaller species, and is readily distinguished by its relatively smooth pileus. Professor Yasuda has given a good figure of it, Plate 28 of Iconibus. We have a colored figure of it from Professor Kusano and specimens in alcohol. Professor Kusano informs us it is a very common species in Japan.

PHALLUS TENUIS (no common name).—Pileus very thin, campanulate, rather strongly reticulate, *bright yellow color;* veil none; stipe white.

History.—This was described by Professor Fischer originally from Java. It is readily recognized in the genus Phallus, being the only species with a yellow pileus. I have a drawing from Japan, from Professor Kusano, and it is the first record of the species in Japan. It evidently occurs very rarely, and grows on rotten wood.

PHALLUS AURANTIACUS.—Hebi-no-ando.—We have no personal knowledge of the occurrence of this plant in Japan, but it is recorded by Dr. Hennings, and is a frequent species of many warm countries. It can be readily recognized, as in shape it closely approximates our figure of Phallus rugulosus, but *both the stipe and the pileus are red.*

MUTINUS BONINENSIS.—The genus Mutinus consists of a simple stem, bearing the gleba on the upper portion. The Japanese species was originally described from the island of Bonin. It will readily be recognized from our illustration. Professor Kusano sends us a colored figure, and a specimen in alcohol. The original species of Mutinus of Europe, viz., Mutinus caninus, has also been recorded from Japan, but I suspect the record was based on this species. If it occurs in Japan, it can be known by having the gleba-bearing portion strongly differentiated from the stem, which is not the case with Mutinus boninensis.

LYSURUS MOKUSIN.—Kitsune-no-yefude.—The genus Lysurus consists of a simple stem, bearing free arms at the apex. In the Japanese species the stem is strongly fluted. In my opinion there are but two species of Lysurus: one of them with a cylindri-

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[1] The correct citation would be "Linnaeus, Fischer," for Fries never recognized any such genus as Ithyphallus.

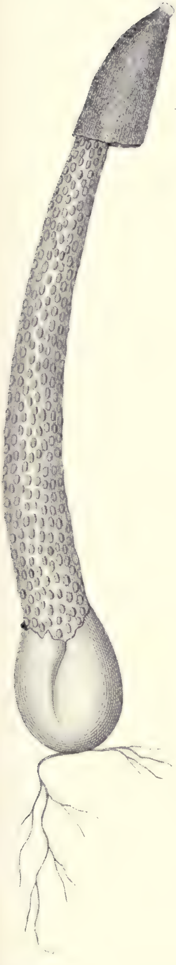

Fig. 238.

Phallus rugulosus.

Fig 239.

Phallus tenuis.

Fig. 240

Mutinus
boninensis.

cal stem, Lysurus Gardneri; the other with a strongly fluted stem, Lysurus Mokusin. The latter only is known from Japan.

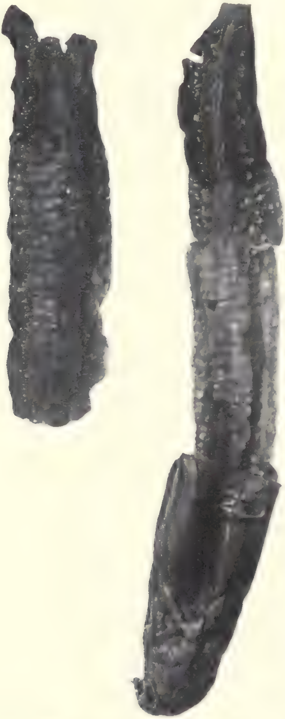

Fig. 241.—Lysurus Mokusin.

History.—Lysurus Mokusin is one of the first foreign phalloids published. It was crudely figured in 1774 by Father Cibot, a missionary in China. Our illustration is taken from a photograph made from a specimen in alcohol, to be found in the Museum of Paris, which had been collected in Japan, by Dr. Harmond.[2] We also have drawings of the plant from Professor Gono and Professor Kusano. It is therefore probably not a rare species, but it is not recorded in Matsumura's list. Professor Gono's drawing shows the plant with a white stem and red arms. We do not know that the color has been previously recorded.

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[2] This was determined and published as Lysurus Beauvaisii, but I am unable to see the slightest difference on which to base a species.

LATERNEA BICOLUMNATA.—Receptacle consisting of two columns united at the top, and free at the bottom. Columns slightly compressed, cylindrical, tapering above. Gleba attached to the under side of the columns near the apex. Color, pale reddish.

History.—We are under obligations to Professor Kusano for the photograph reproduced herewith from which the description has been made. In my opinion, it is not only a previously unnamed species, but it is the first time the genus Laternea has ever been recorded from Japan. The genus Laternea is principally an American genus, one species, Laternea columnata, being very common in our Southern States and throughout South America. There is a single collection of Laternea known from Africa, but we believe this is the first record of the genus from Asia. The genus Laternea usually has from four to five columns, and we base this species principally on the fact that it has but two columns. Professor Kusano states this is invariably the case. There has been but one similar plant named before, viz., Laternea pusilla,[3] which Berkeley described from Cuba. It is very similar to the Japanese species, but is a tiny little plant, not more than one-fourth as large as the Japanese species. But a single specimen of it is known, now preserved at Kew. Taking into consideration the strong discrepancy in size and the remoteness of situation, we feel that we are justified in naming the Japanese plant as a different species.

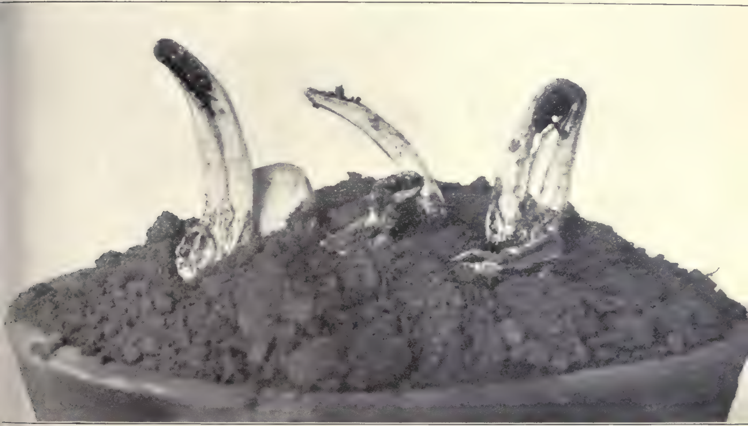

Fig. 242.—Laternea bicolumnata.

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[3] When Professor Fischer wrote the first paper he had not seen the specimen, and he referred Laternea pusilla as a variety of Clathrus cancellatus, and called it Clathrus cancellatus, var. pusilla, which was rather a rash proposition, for Laternea pusilla has no possible resemblance to Clathrus cancellatus. After Professor Fischer had gone to London and had seen the plant he corrected his name, recognizing it as a good species, but referring it to the genus Clathrus. As there was already a Clathrus pusillus he renamed it Clathrus Berkeleyi. In my opinion there are few more distinct genera than Clathrus and Laternea, and I feel that if Professor Fischer had seen the plant before passing an opinion on it, he would have saved both these synonyms.

SOURCE OF THE ILLUSTRATIONS USED IN THE PRECEDING ARTICLE.

Fig. 236, Phallus indusiatus, Photograph made in Samoa.
Fig. 237, Phallus impudicus, Photograph made in France.
Fig. 238, Phallus rugulosus, Illustration by Professor Yasuda.
Fig. 239, Phallus tenuis, From drawing by Professor Kusano.
Fig. 240, Mutinus boninensis, From drawing by Professor Kusano.
Fig. 241, Lysurus Mokusin, Photographed at Paris.
Fig. 242, Laternea bicolumnata, From photograph by Professor Kusano.

HEWING TO THE LINE.

Outside of the domain of pure fiction, I believe there is no subject in which the literature contains such a small proportion of truth as does that of mycology. Under the present system of using plant names for advertising purposes, there has developed a class of writers who apparently do not have the slightest regard for the truth of the subject, if they can advance some pretext for getting up new names or new combinations to which to affix their own. In fact, much of the so-called mycological literature would better be called mythological. We have made a vigorous war on this situation since it has become apparent to us, and we are glad to see that others are coming to our aid.

In Ceylon an interesting article has just appeared by Mr. Petch, entitled "Revision of Ceylon Fungi." Mr. Petch handles the subject without gloves, and if the article were not so long we should be glad to reproduce it in full. We can not refrain from quoting a single sentence to give an idea of the vigorous way in which the subject is handled. When mycologists begin to tell the truth about things in good plain English there is hope for the future. It is in my opinion better to call a spade a spade than to call it a "pala," hoping your readers will not recognize it.

"Berkeley's Ceylon species and genera have been written about on several occasions, and the names have been subjected to the usual changes, sometimes after an examination of his specimens, but more often without. In consequence, the reduction of his species to synonyms, after an examination of the original specimens and drawings, and a comparison of these with fresh specimens, introduces rather curious results. For example, Berkeley "described" the same fungus three times as Psalliota trachodes, Psalliota pedilia, and Psalliota poderes. Saccardo leaves the first in Psalliota, but puts the other two in Chitonia, while Hennings later leaves the first two in Psalliota and Chitonia respectively, but institutes a new genus, Chitoniella, for the third. **Yet there is only one species!** In connection with this name-changing, it may be pointed out that it is hardly fair, when Berkeley wrote Agaricus (Lepiota) rubricatus B. & Br. to obtain an advertisement by writing Lepiota rubricata."

THAT RED LYSURUS.

Mr. Harold Murray of the Botanical Institute of Manchester, England, has kindly forwarded me a photograph made from alcoholic material of the Lysurus, with red arms, that was found at Manchester. Mr. Murray advises me that the plant has a white stem, and in my opinion it is simply a form of Lysurus Gardnerii, which I believe is of world-wide distribution. There is one feature in his photograph that I have not known in connection with Lysurus Gardnerii, viz., the large, tubular structure as shown in cross section. As far as the records go, the stem of Lysurus Gardnerii should have a uniform, cellular structure. However, so little is known about our phalloids that when questions of this kind come up we can not say whether it is a difference that exists or whether it is a character which has not been known as to the usual plant. I shall be glad if any of my friends who may find species of Lysurus will pay particular attention and make photographs of sections of the stems.

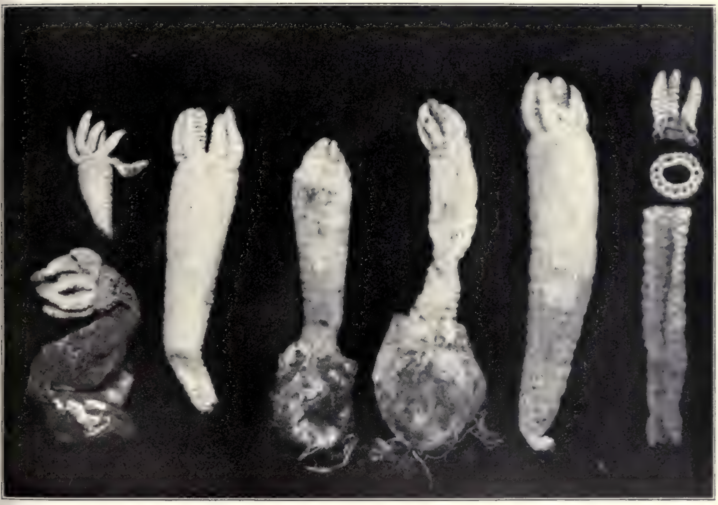

Fig. 243.—Lysurus Gardnerii.

Since this article has been in type, we have had a letter from Professor Petch, stating that the arms of " Lysurus Gardnerii " are joined at the top and never separate. In that event, our conception of the genus is entirely in error, and the whole account would have to be corrected. There is nothing about the type specimens at Kew to indicate that the arms were ever joined.

ANTHURUS ASEROEFORMIS.

We are very much pleased to be able to present, through the kindness of Professor D. McAlpine, Melbourne, Australia, the first photograph that has been published of this rare Australian species. We append herewith Professor McAlpine's description of the fresh specimens, which, taken in connection with the photograph, gives us a perfect idea of the plant. It is one of the rare phalloids of Australia, but one that can not fail to be recognized by any of our Australian friends who may meet it if they will simply bear in mind that the photograph well represents the plant and that when fresh it is red. The plant is extremely fragile when fresh, and in the photograph one of the arms has been broken off. However, it is probable that the plant varies as to the number of arms.

History.—This plant is called Anthurus Müllerianus, form aseroeformis, by Professor Fischer in his Untersuchungen, 1890, and he gives a good illustration of it on Plate 6. He referred it, I think with considerable question, as a form of Anthurus Müllerianus, figured by Kalchbrenner. I suspect if the truth were known it would turn out to be the original of Kalchbrenner's species. Kalchbrenner shows quite a different plant, having eight arms and a distinct cup at the base, cfr. fig. 14 of our pamphlet, The Phalloids of Australasia. But Kalchbrenner got his original idea from a dried specimen. He was a good artist, in that he drew figures to represent his ideas rather than the specimens. If you will compare Kalchbrenner's figure with the photograph from Professor McAlpine, you can readily understand how Kalchbrenner may have gotten an erroneous idea of the plant from a dried specimen. Kalchbrenner called the plant Anthurus Müllerianus and I presume the "I saw it first" school would say that should be the name of the plant without regard to how big a blunder Kalchbrenner made in publishing it.[5]

DESCRIPTION FROM PROFESSOR McALPINE, DRAWN FROM THE FRESH PLANT.

Receptacle with hollow stem, expanding above into five arms, directed upwards and outwards. Stem salmon pink, slightly darker at top, fully three inches long, rugose with small depressions running more or less in lines and slight ridges running cross-wise, so that it looks as if divided into a series of squares, about ½ inch in diameter towards the tapering base and ⅞ inch at top. Arms three inches long, merging into stem and tapering to a point, blood-red on inner face, convex and broken up into larger or smaller cavities, on outer face there is a continuation of the color of the upper portion of the stem and gradual darkening until toward the tip it is blood-red like inner face with thickened, slightly raised margins and central furrow broken up into small cavities.

Gleba blackish with tinge of bronze green, extending along the inner surface of each arm, but not covering the slender tip.

Volva somewhat cup-shaped, about as long as broad (1½ inches) dirty-white, splitting at the apex, tapering towards the base and provided there with turfs of elongated fibrous roots.

Spores hyaline, cylindrical to elongated ellipsoid, rounded at both ends,

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[5] We do not print these criticisms of Kalchbrenner's work unadvisedly, for while we know nothing as to the original of Anthurus Müllerianus and we think there is no type in existence, we do know that Kalchbrenner published several fake pictures. The most notorious of them was the picture of Secotium excavatum, based on a Strobilomyces and so drawn or mis-drawn that it really had some resemblance to a Secotium.

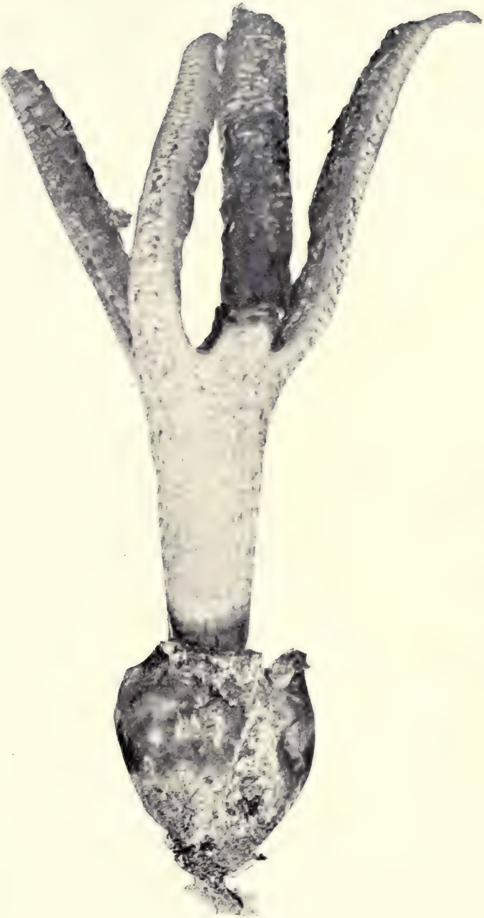

Fig. 244

Anthurus aseroeformis.

sometimes vacuolated but generally homogeneous contents, 6-8 x 2½-3 mic., occasionally 9 mic. long.

A solitary specimen growing in a garden among violets, near Melbourne, Victoria, April, 1907. Forwarded by C. French, Jr. It had a very disagreeable smell. Owing to its fragile nature one of the arms fell away and only the arm to the right in the photograph shows the slender tip.

THE RESULT OF KUNTZEISM.

We have made the following summary of a recent paper by Mr. Murrill:

Number of juggled names	339—83%
Number not juggled	70—17%
Number with "Murrill" added	332—81%
Number that escaped	77—19%

The full objects of the paper being set forth in the above summary, it is hardly worth while to comment on it, but we present Professor Sydow's review in the Annales Mycologici to illustrate how this line of work impresses European mycologists.

> "It is characteristic of this work that hardly a single species is enumerated under the name by which it had hitherto been known and used. The reason for it lies principally in the fact that the heretofore accepted genera are resolved into numerous small genera. The author differentiates between not less than 66 genera of Polyporaceæ, mostly differing from each other by only such characteristics as heretofore were used to differentiate between species. This procedure, on account of the extent to which it has been practiced by the author, will hardly meet with the approval of mycologists at large. Futhermore, the author rigidly adheres to the principle of priority which frequently causes, in addition to the change in the name of the genus, also one in the name of the species; **thus about nine-tenths of all species mentioned bear the name of "Murrill" as author.**

Mr. Murrill, by the simple process of inventing a lot of useless "genera" and juggling many names of the host of (useless) "genera" invented before him, adds his name (in his paper) to 332 out of the 409 species that he considers. Professor Sydow was justified, on the face of it, in thinking this to be the main object of the paper.[4] Mr. Murrill is not the first, but the worst, that ever engaged in this kind of work, and the farce of the whole proceeding is, that it is put forth under the guise of producing "stability" in nomenclature. The only effect it will have will be to fatten the already overgrown and unwieldy synonyms.

A new Vireo.—I note that Mr. Oberholser has found a new Vireo close to "Vireo bellii bellii." Such nomenclature is enough to give a man a "bellii bellii" ache.

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[4] As a matter of truth Mr. Murrill himself does not believe in such foolishness, nor does any one else who has an elementary knowledge of polyporoid classification. The true explanation comes under the head of "Economic Botany," that is, to Mr. Murrill.

A POSSIBLE MISTAKE IN JAPAN.

According to the Index Plantarum Japonicarum, Calvatia gigantea (there given under the erroneous name of Globaria Bovista) is a common species in Japan. I think this is an error. In fact, I question if Calvatia gigantea grows in Japan. The "giant puff ball" of Japan is not the same as the "giant puff ball" of Europe and America, but is Lasiosphaera Fenzlii, which was considered in Mycological Notes, page 191, Plate 19. It differs from Calvatia gigantea in its peridial characters and particularly in its spore characters, having strongly echinulate spores, while those of Calvatia gigantea are smooth. Professor Kusano writes to me that the original record in the Index Plantarum Japonicarum was from specimens that grew in the Botanical Garden of Tokyo, and he sends me a portion of the gleba which from its echinulate spores can readily be determined as Lasiosphaera Fenzlii. I have also gotten Lasiosphaera Fenzlii from Professor A. Yasuda, cfr. Letter 12, and it is the only giant puff ball of which we have any authentic record of its occurrence in Japan.

There are a number of Japanese names given for this plant in Matsumura's list. Professor Gono favors me with the English equivalents: Yabu-dama, jungle ball; Yama dama, mountain ball; Hokori-take, powdering fungi; Kemuritake, Smoking fungi.

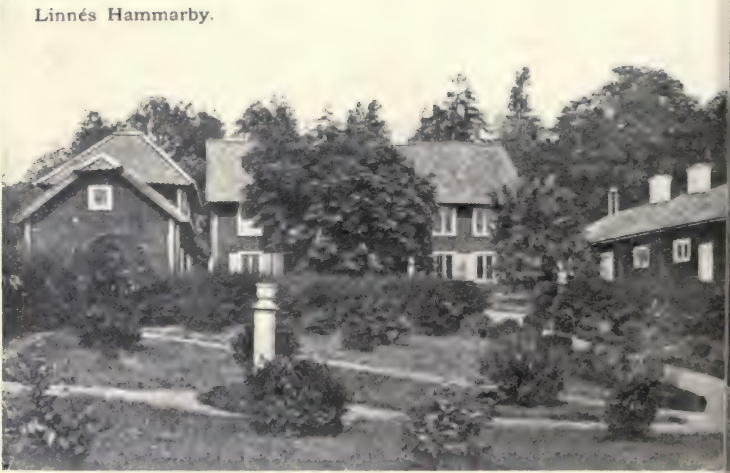
NOTELETS.

Polyporus alboluteus.—Mr. Ellsworth Bethel kindly informs me this is quite a common plant in the high mountains in Colorado, being found just below the timber line, and growing so far under logs that it is usually overlooked. Inasmuch as it is covered with ice and snow, it has a tendency to bleach out on the under surface which gives it a whitish appearance. I made a criticism of the name alboluteus on page 379 of Mycological Notes, as the plant is neither white nor yellow, and I am still inclined to think it is a very bad name for it. The plant is orange, and from Mr. Bethel's information the "white" appears to be due to being frost bitten.

Mutinus caninus.—"I see in one of your notes on phalloids that you are inclined to doubt that Mutinus caninus is inodorous. This species is not uncommon here in Denmark, and while not absolutely inodorous, is nearly so. In fact, the odor is so faint that it can not be detected at a distance of a few centimeters."—Jacob E. Lange.

Fistulina hepatica.—In my account of this plant I have compared its edible qualities to that of a piece of sole leather. Mr. Edward P. Ely, of Minneapolis, writes me he finds it quite frequently, and that when young it is tender and juicy, and he is fond of it cut in slices and eaten raw with mayonnaise dressing. I have never seen it growing in quantities where it could be collected young, but can testify from my experience that it has very little edible value when mature.

Dictyocephalos curvatus.—I was under the impression that this puff ball was only known from a single collection, but Mr. Bethel informs me that it is found quite abundantly in the arid mesas of western Colorado, close to the Utah line. He has made but one good collection, usually finding it too late for good specimens. He has, however, recognized fragmentary remains in many places.



THE HOME OF LINNÉ.

There still exists the country residence of Carl von Linné, or Linnaeus, as he is usually known by the Latin form of his name. The home is located about five or six miles from Upsala, and is preserved exactly as when Linné lived there—the same furniture, the same pictures on the walls, even the clothing that Linné wore hangs in the closet. The illustration above is taken from a souvenir postal card that I bought from the attendant. As I could not speak Swedish with her, I did not learn to whom the world is indebted for the preservation of this Linnaean museum, but I presume it is under the care of the Swedish government. Linné's living house and his study rooms are in the building directly in front. The tree shown in the picture as before the house, has recently blown down; otherwise I think the illustration presents the same scene as when Linné lived there. Not shown in the picture but some yards back in the woods Linné built his museum. It is a square building with a single room about twelve feet square, and contains his library, his herbarium case and other cases for specimens. As is well known, the specimens are in the rooms of the Linnaean Society at London.

THE

TYLOSTOMEAE

ILLUSTRATED

WITH TWELVE PLATES AND SIX FIGURES

By

C. G. LLOYD

CINCINNATI, OHIO, U. S. A.

FEBRUARY, 1906

UNIVERSITY OF CALIFORNIA

P. HARIOT.

The work on this pamphlet was done at the Museum of Cryptogamic Botany, Paris, France. Monsieur P. Hariot, the very obliging and courteous curator of the Museum has extended to me every facility and aid in the work, and in grateful recognition, I beg to dedicate this publication to him.

TYLOSTOMEAE.

The Tylostomeae embrace all Gastromycetes with dry spores, having peridia borne on distinct stalks that are not prolonged as axes. As thus defined it is a very natural tribe[†] of "puff balls," differing from the Podaxineae which also have the peridia borne on stalks which, however, are continuous as axes of the gleba to the apices of the peridia.

GENERA OF TYLOSTOMEAE.

We would divide the tribe into six genera, as follows:

Peridium without definite mouth,	
Volva none	Queletia.
Volva thick, permanent	Dictyocephalos.
Volva not permanent	Schizostoma.
Peridium opening circumscissilly,	
Gleba with capillitium and "annulated cells"	Battarrea.
Gleba without these characters	Battarreopsis.
Peridium with definite mouths,	
Peridium seated on the broad apex of the stipe	Chlampdopus.
Stipe inserted into a "socket" at base of peridium	Tylostoma.

The Genus Queletia.

This genus consists of a single known species. It may be likened to a huge Tylostoma, having the same colored gleba, and the stipe inserted into a "socket" at the base of the peridium. The peridium does not have a definite mouth, but breaks irregularly after the manner of a Calvatia. The genus could be described in the same general terms as the genus Schizostoma, but the plants are quite different. Queletia is widely different from Tylostoma in general appearance, size, etc. Schizostoma is a good Tylostoma save as to dehiscence.

QUELETIA MIRABILIS (Plate 10, also Fig. 77, page 185).—Plants from 3 to 7 cm. in diameter, stem 8 to 15 cm. long. Cortex apparently a thin, white coat that breaks up into granular particles and mostly disappears from old specimens. Endoperidium firm, hard, brown, breaking open irregularly when mature. Stem inserted into a "socket" at base of peridium, thick, ragged with the shreddy scales of a fibrillose cortex. Gleba dark, rusty brown. Capillitium light colored, subhyaline under the microscope, tubular, branched. Spores globose, coarsely warted, 5-6 mic.

[†] Monsieur Patouillard tells me "c'est peu rationnel" to include in the same tribe Chlamydopus and Dictyocephalos, which have permanent basidia, with Tylostoma, etc., the basidia of which are quite different, and he is probably right. As long, however, as the basidia of so few "puff balls" are known, I can not consider it practicable to make them the basis of classification in these plants.

This plant is one of the mysteries of the puff ball world. It is only known from four collections (*all undoubtedly abventitious*), two made in France, one in England and one in the United States. (Cfr. Mycological Notes, pages 135, 185 and 217.)

SPECIMENS IN OUR COLLECTION.

Pennsylvania, Dr. Wm. Herbst.
France, Prof. N. Patouillard.

The Genus Dictyocephalos.

This is a curious genus, known from a single collection. It has a thick volva, remaining as a cup at the base of the stem. A thick, woody stem, thickening above and bearing a thick, flattened, pyramidal peridium.

DICTYOCEPHALOS CURVATUS (Plate 11).—Volva thick, persisting as a cup at base of stem. Stem long, hard, woody, tapering to the base and bearing the peridium on its broad apex. Peridium thick, rough, hard, flattened, pyramid in shape (supposed) to rupture irregularly. Capillitium septate, colored, branched. Spores subglobose, 5-6 mic., warted.

This curious plant was collected by E. Bethel in 1897 at Colorow, Colorado. The plants grew in alkaline, adobe soil in a semi-desert region. The specimens are preserved in the Ellis collection at the New York Botanical Garden and no others are known. (Cfr. Myc. Notes, page 136.)

The Genus Schizostoma.

Plants resembling the genus Tylostoma, and having the stem inserted in a socket at base of peridium. Peridium thin, fragile, not opening by a definite mouth, but breaking into fragments as the peridium of the genus Calvatia.

SCHIZOSTOMA LACERATUM (Plate 20).—Stem long, cylindrical, inserted into a socket at base of peridium. Cortex almost completely disappearing from mature plant. Peridium thin, fragile, the upper portion breaking away irregularly in dehiscing. Capillitium long, tortuose, intertwined, aseptate, deeply colored, branching threads. Spores globose, 4-5 mic., finely warted.

This plant appears to be frequent in equatorial Africa and the original type specimens are found in the museum at Berlin, also abundant collections by Schweinfurth in recent years. (Cfr. Myc. Notes, page 192.)

SYNONYMS.—Tylostoma laceratum (Fr. Syst. 3, 44), Tylostoma Schweinfurthi (Eng. Jahr. 14-359), Tylostoma Kärnbackii (Mss. name).

SPECIMENS IN OUR COLLECTION.

Africa, collected by Schweinfurth and given us by Dr. Hennings.

The Genus Battarrea.

Young plants enclosed in a volva. Peridium stalked, opening circumcissilly, the top of the peridium falling away, leaving the gleba borne on the lower convex half of the peridium. Gleba yellowish, furruginous, consisting of globose, warted spores, abundant, subhyaline capillitium, and a special capillitium that no other genus has. This "false capillitium" consists of thick cells with the walls annulated or spirally thickened which are known as "annulated cells." These cells are very curious and no one knows what office they serve to the plant. Nothing similar is found in other known genera, and they do not occur in the very similar genus Battarreopsis. Prof. E. W. D. Holway has prepared a microphotograph (Fig. 1) which we think illustrates these cells better than any yet published.†

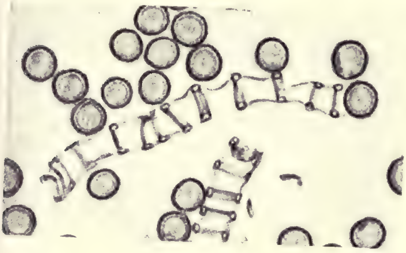


Fig. 1.

All species of Battarrea are very much alike as to their gleba characters, viz.: spores, capillitium and annulated cells, but they vary much as to size, nature of the stem scales and especially as to volva characters.‡ In my opinion five known species or forms can be distinguished. The volva and stem scales seem to afford the best characters. In most plants the upper half of the peridium is closely adnate to the volva, and when the volva breaks and falls away it carries with it the upper half of the peridium, thus exposing the gleba mass at an early stage. In Battarrea Digueti the entire peridium is *free* from the volva and *remains attached in its place* long after the volva has fallen away.§ Battarrea Guicciardiniana has what seems to me to be a false volva which remains clasping the base of the stem as shown in our Plate 74.

There is a tradition connected with the genus Battarrea that the volva of the young plant is filled with a mucilage. This dates back more than a hundred years and has not been observed in recent years. It is possible that the old botanists have mistaken phalloid eggs for those of Battarrea.

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† The usual copied figure originally by de Bary shows the rings as spiral but they very rarely appear spiral to me. Usually they are annular as shown in our figure and in most of Miss White's figures. Occasionally, however, I note a specimen that has these thickenings strongly spiral, and such a specimen can be seen at Kew, collected in Egypt by Mrs. Lloyd-Wynne.

‡ Recently Dr. Hollós advanced the opinion that they are all one species, and he compiles the names of several plants he never saw and reduces them to synonymy. If the Doctor would hunt up and study the specimens instead of rummaging through a library, he would find differences that can not be brushed aside by arranging them in parallel rows and calling them synonyms.

§ Every specimen we have seen has the upper half of the peridium attached, though we think it must fall away in very old specimens.

GEOGRAPHICAL DISTRIBUTION.—The genus Battarrea is of wide distribution, though the individuals are of rare occurrence. It has been found very rarely in England,† and is known from but one locality in France.‡ It has been collected once in Italy, but is not known from the remainder of Europe except from Russia and Hungary. In the United States it is known only from Arizona and the Pacific Coast. In South America several collections are known and three "species" have been described.§ Two collections have reached Europe from Africa and one from India.

THE SPECIES OF BATTARREA.

BATTARREA PHALLOIDES (Plate 28).—Upper part of the peridium adnate to the volva and falling away attached to the volva. Volva breaking early, sometimes persisting as a cup at the base of the plant, but usually absent from herbarium specimens. Capillitium hyaline, abundant. Annuated cells abundant, 60-80 mic. long, 6-8 mic. thick, with thick annular markings. Spores subglobose, granulose, 5-6 mic. This is the original species discovered in England. The stem is slender, 8 to 12 inches high and about a centimeter thick. It is covered with fine scales. The typical form occurs in England, France, Australia and California.

SPECIMENS IN OUR COLLECTION.

California, L. A. Greata.
France, Ernest Olivier, Rev. H. Bourdot.

BATTARREA STEVENII (Plate 28).—This form is originally known from Russia. It differs from the type form in its more robust growth and the thick, lacerated, coarse scales covering the stem. It is unquestionably only a large form of Battarrea phalloides and can not be distinguished by any sharp lines.

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† It has been noted in Grevillea but I have not the reference. I should be thankful to any of my English correspondents for information and data on the occurrence of Battarrea in England.

‡ I am indebted to Monsieur Ernest Olivier (who is the only botanist in France who has had the good fortune to collect the plant) for some fine specimens and the following very interesting note:

"C'est le 22 septembre 1892 que pour la première fois j'ai trouvé le Battarrea phalloides croissant sur le sol dans l'intérieur d'un chêne creux sur une couche épaisse de débris d'écorces et de feuilles décomposées. Quelques jours après, j'en ai retrouvé deux individus dans les mêmes conditions dans l'intérieur d'un autre chêne distant du premier d'environ 500 mètres.

Ces deux chênes sont situés dans une propriété m'appartenant, les Ramillons près de Moulins (Allier).

Depuis cette époque, chaque année, j'ai vu le Battarrea au nombre de plusieurs exemplaires surtout dans l'intérieur du premier chêne.

Au sortir du terreau, ce champignon est enveloppé d'nue volve et apparait sous l'apparence d'un petit oeuf; le stipe grandit rapidement en quelqeues heures; le volve se sépare en deux parties; l'une reste au pied du stipe tandis que l'autre est enlevée en l'air recouvrant le chapeau; elle est d'abord molle, mais elle se dessèche bien vite et tombe à terre découvrant les spores innombrables et leur permettant de se répandre.

Je n'ai jamais vu que des stipes de consistance fibreuse et je n'ai pu constater s'ils sont mous au début de leur croissance, ce que je serais porté à croire; mais cette croissance est tellement rapide que je n'ai pu surprendre un de ces champ gnons dans un demi développement."

§ One author seems to think that the soil of South America is wonderfully prolific in producing "new species." At least everything is a "new species" that he finds.

SYNONYMS.—The plant was originally called Dendromyces Stevenii. I can not note any distinction in the type of Battarrea Gaudichaudii from Peru, Battarrea Muelleri from Australia or Battarrea lacinita from California.

SPECIMENS IN OUR COLLECTION.

Russia, A. Jaczewski.
California, L. G. Yates, L. A. Greata.

BATTARREA LEVISPORA (Plate 75).—On comparison of the spores of this plant with those of the previous forms they are found to be notably smoother, and hence I consider it a good form. This, however, seems to be the only difference. The type specimen has a shorter stem than the form Stevenii and a thicker stem than the form phalloides. It is known only by one collection from India.

BATTARREA GUICCIARDINIANA (Plate 74).—Volva ample, large, tardily breaking, furnished at the base with a kind of secondary volva, an inner membrane which remains clasping the base of the plant as a subglobose ball. (See Plate 74.) Upper half of the peridium adnate to the volva and falling away early.† Stem with coarse, thick, appressed scales. Gleba with more slender (120 x 5-6) annulated cells but otherwise same character as typical Battarrea phalloides.

HISTORY.—As far as I know only a single collection of this species has been made, in a garden at Florence, Italy, about 1880, described by Cesati and the specimens taken to Paris for exhibition as a botanical congress and were then given to the Museum at Paris where they are now preserved.‡ Since this page has been in type I have received from Walter Gill, Australia, specimens undoubtedly Battarrea phalloides, which have the same "secondary volva" as shown on Plate 74. We are therefore induced to doubt this character as a specific distinction of B. Guicciardiniana.

BATTARREA DIGUETI (Plate 75).—Peridium entirely *free* from the volva, the upper portion remaining on the mature specimens. Stem scaly, fibrillose. Gleba characters as in Battarrea phalloides.

This plant differs from all other known species in the *persistent* peridium. It has been collected in lower California and in Arizona and was described by Miss White as Battarrea Griffithsii.§ (We would merely remark in passing that "Battarrea arenicola, new species," described by E. B. Copeland in Annales Mycologici (1904), neither from his description nor his figure has any resemblance whatever to the genus Battarrea nor more to the genus Padaxon to which he suggests it may belong.)

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† The specimen shown in our plate still retains the upper portion (which has been fastened with a pin) of the peridium with a fragment of the adnate volva. No trace of it remains on any of the other specimens of the collection.

‡ Should our readers be inquisitive to know how it received the name "Guicciardiniana," the explanation is that the Countess Paolina Guicciardini-Serristori owned the garden in which she condescended to let the plant come up. Let us be thankful it was not given her full name as a token of recognition of the favor.

§ Personally we would much prefer to retain this name which is that of a well-known American botanist and very appropriate for an American plant. Unfortunately the "rights of priority" forbid.

The Genus Battarreopsis.

This genus, very close to the previous in general appearance, is quite different in gleba structure. This is composed of cells filled with spores, somewhat of the nature of a Polysaccum, but the cells seem to be formed of plates with partitions. The color of the gleba, the general habits of the plant and the spores are similar to those of Battarrea, but there is no capillitium or "annulated cells."

BATTARREOPSIS ARTINI (Plate 22).—Only one specimen of the plant is known which was found at Alexandria, Egypt, and is preserved in the museum at Berlin. It grew under abnormal conditions and was probably modified by its surroundings. A full history of the specimen is given on page 194 of Mycological Notes.

The Genus Chlamydopus.

This genus seems to me to be very close to Tylostoma and is still included by some authors in that genus.† It differs from Tylostoma in having the peridium seated on the broad apex of the stem; in Tylostoma the stem in inserted in a "socket" in the base of the peridium. Besides there is a basidial difference and I think probably a difference in the volva.‡

CHLAMYDOPUS MEYENIANUS (Plate 10).—Volva (normally) persisting as a cup at the base of the plant. (Usually absent in herbarium specimens.) Peridium globose, dehiscing by a torn mouth, borne on the broad, concave apex of the stipe. Stem long, tapering to the base, smooth, sulcate. Capillitium subhyaline, branched, sparingly septate. Spores subglobose, 6 mic., granulose.

HISTORY.—The plant was originally collected in Peru and described and figured as Tylostoma Meyenianum. Next it was found in New Mexico by Wright and correctly referred by Berkeley. Type specimen from Peru is preserved at Berlin and Wright's specimens are at Kew and Cambridge. Spegazzini (1899) figured what is unquestionably the same plant as a new genus and "new species," Chlamydopus clavatus, from Buenos Aires. A single specimen is known from Australia and at Kew I have seen a specimen labeled "Battarrea guicidineana." The specimen is very old and the locality is not clearly stated. I am told, however, that it came from the North African desert region. Prof. C. V. Piper has collected Chlamydopus Meyenianus in recent years at Pasco, Washington, and gives an interesting account of its habits. (See Myc. Notes, page 134.)

SPECIMENS IN OUR COLLECTION.

Washington, C. V. Piper.

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† We cite an example of how mycologists differ on such things. Hollós and Fischer include the genus in Tylostoma. Monsieur Patouillard tells me that in his opinion it should not be classed in the same tribe as the genus Tylostoma.

‡ When the life histories of these plants are known I think it will be found that Chlamydopus has a true volva and Tylostoma never.

The Genus Tylostoma.

This is the largest genus and the smallest individuals that belong to the tribe Tylostomeae. It is spread over the earth's surface and every locality has probably one or more species. The genus is more common in sandy countries. All species with the exception of two or three grow in the ground. Tylostoma exasperatum (and perhaps a couple of others that are little known) always grow on branches of logs.

The genus can be thus described. Exoperidium of the nature of a cortex, separating more or less from the upper part of the mature plant, but usually remaining more or less persistent at the base of the peridium. Endoperidium opening by a definite mouth (in a few species by several mouths). There is a depression or "socket" at the base of the peridium into which the stipe is inserted. Gleba of branched, septate, capillitium mixed with the spores. Stipe distinct from the peridium and inserted into a "socket" at its base.

CORTEX.—We call the exoperidium of a Tylostoma a cortex. Usually it is in the nature of a sand case that separates more or less according to the age and exposure of the plant, but generally partially remains at the base of the peridium. Sometimes it is more of a distinct membrane, the remains forming a cup at the base of the peridium; often it is smooth; usually it is more or less granular with adhering sand. In a few species it bears distinct warts or granules (not sand) of the nature of scales, and in one species (exasperatum) these are strongly developed forming spines.

MOUTHS.—Tylostomas vary more in the nature of the mouths than in any other one character, and we have used this as a basis of our classification. We would divide the species into sections with five distinct types of mouths.

Tubular Mouths (Fig. 2).—Many species of Tylostoma are characterized by having naked, round, tubular, definite and usually slightly (sometimes strongly) projecting mouths. Such mouths are often called mammose. (The species Tylostoma mammosum is named from the mouth character.) However, in the literal signification of the term, the name could be better applied to such mouths as are shown in Fig. 5.

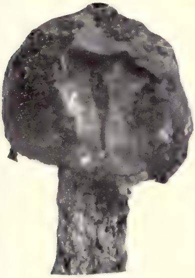

Fig. 2.

Irregular Mouths (Fig. 3).—In a few species the mouths are naked, and usually slightly projecting, and instead of being round and tubular are elongated openings. The few species having this type of mouth often have several mouths on the same peridium, and frequently they are confluent. Species with the other types of mouths never, to my knowledge, have but a single central mouth.

Torn Mouths (Fig. 4).—A few species dehisce by a single torn aperture, not furnished with fibrils as in the following, and not definitely marked as in the preceding. All (excepting one) of the species with such mouths that have come to my notice, are Australian.

Fibrillose Mouths (Fig. 5).—Many species have the mouth aperture surrounded by a layer of fibrillose tissue. This layer is built up *on* the peridium, around the mouth, and is not merely a fibrillose opening as is the following type. The fibrillose layer is variously developed in different species, more strongly in Tylostoma poculatum than in any other species to my knowledge. In old specimens this fibrillose layer is often worn away and then the mouth becomes simply a round, naked opening. (See Figs. 5, 6 and 7, Plate 82.) Sometimes this fibrillose layer takes from the imprint of the cortex a granular appearance as in Tylostoma granulosum.

Fimbriate Mouths (Fig. 6).—A few species (mostly South American) have mouths appearing fibrillose, which is the texture of the peridium walls forming the mouth. This is a different structure from the preceding type in which the fibrillose layer surrounding the mouth is adnate to the peridium. These mouths we would call fimbriate, and although the term is inaccurate, it is the term applied to Geasters with such mouths. There is a tradition in Europe that there is a fimbriate mouthed species in Europe, and such a species (Tylostoma fimbriatum) is usually carried in their books. I am satisfied no such species occurs in Europe and that it is purely an error.†

COLOR.—In practice I find that the color of the peridium is an important character to distinguish species, and most specimens can be readily distinguished as "colored" or "uncolored." The term "uncolored," of course, does not mean white, but pale and not marked with shades of reddish brown as the "colored" species have. Rarely we note specimens the same in all other characters but varying as colored and uncolored. In such cases we consider color subordinate, but usually color is a constant and strong character. Stems also vary in degrees of color but not as markedly as the peridium.

CAPILLITIUM.—The capillitium of Tylostoma is always composed of branched, hollow, septate, tubular threads. Usually it is subhyaline under the microscope or slightly colored. I think the color varies according to the conditions, age, etc., of the specimens. The color is rarely enough developed to form a marked character—in but three species to my knowledge, viz.: volvulatum,‡ obesum and the allied Schizostoma laceratum. Recently elaborate articles have been written on the septation of Tylostoma capillitium and it is claimed that constant characters for each species can be drawn from such septation. I do not deny that septation varies, sometimes rounded at the ends, sometimes squarely joined, sometimes swollen, sometimes not, but I have frequently noted more than one character on the same slide and I have not found it of service, in practice, to distinguish species. I have noted the septation characters as I see them in my descriptions but I do not place much stress on them.

SPORES.—The spores of Tylostomas are generally very uniform in size, usually 5-6 mic. Tylostoma Longii has very small spores, 2½-3 mic., but as it agrees with albicans in all other characters I hold it to be a variety. The surface of spores affords better characters. Some species have smooth spores, most have granular spores and a few have aculeate spores. Smooth spores when dry often appear rough because of the shrivelling of the surface. It is therefore well to treat spores with warm lactic acid to swell the epispore in order to be sure of their character. Even then it is sometimes difficult to decide if the spore is smooth or slightly granular. In all such cases we have noted the spores as smooth.

STEMS.—Internally the stems of Tylostomas are very similar, usually hollow, with some loose, central fibrils. Externally the bark or cortex often affords good characters. Frequently it is smooth or longitudinally striate; often it is broken into little scales; sometimes it develops or is torn into large, generally caducous, scales. Species having these scales are strongly marked when growing but can not always be recognized from the herbarium specimens as the scales generally fall away. A few species of Tylostoma have a distinct sheath surrounding the stem. In one species (volvulatum) the sheath breaks, part forming a collar at the base of the peridium, part a cup at the base of the stem. In this case it is known (not correctly I think) as a volva. To my knowledge two other species have distinct sheaths but of a more fibrillose nature, breaking irregularly and forming a torn collar. In reality all species of Tylostoma have stem "sheaths," but in most species it is closely adnate to the stem and forms the cortex or "bark" of the stem.

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† Dr. Hollós in his recent work shows an enlarged drawing of the mouth of "Tylostoma fimbriatum." I think the Doctor either imagined a mouth to fit the name, or got his ideas from some of the misnamed specimens from South America to be found in the museum of Berlin. I have never seen a specimen from Europe with such a mouth and I do not believe it occurs.

‡ To show how observers often differ on such subjects it may be cited that Petri describes the capillitium of volvulatum as hyaline.

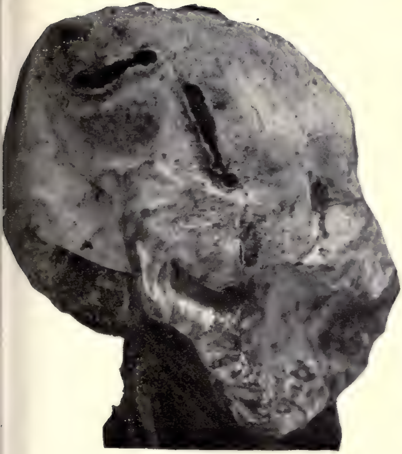

Fig. 3.

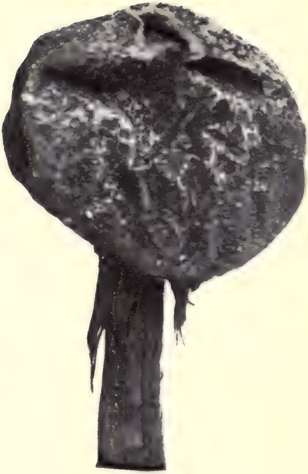

Fig. 4.

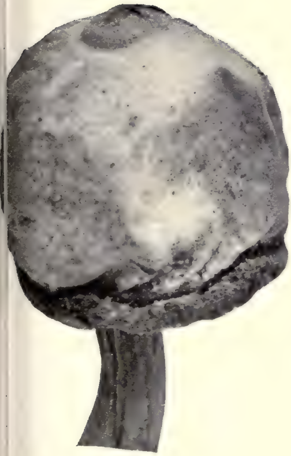

Fig. 5.

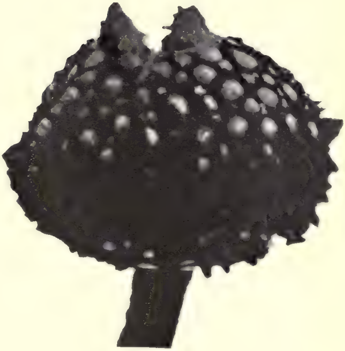

Fig. 6.

Forms.

The genus Tylostoma exhibits more species or forms than any other family of "puff balls" (except perhaps Lycoperdon). Some of the forms are of wide distribution, constant as to character, and are of course good "species." Others seem very local or rare and we have received a number of specimens that do not accord with the following described "species." We have felt it advisable in most instances not to describe "new species" from a single collection unless it presents very marked characters, and there are a number of unnamed collections in our museum, awaiting additional material, and if it is not received they will not be determined by us. A list of these is given on page 27.

Geographical Distribution.

In Europe there are only three frequent species, viz.: mammosum, granulosum and squamosum. Mammosum is by far the most common and is the only one known in England. In the south (Italy) it seems to give way to granulosum. A number of species or forms have been recently described which are evidently rare or local, viz.: pallidum, Bresadolae, brevipes, armillatum, Giovanellae, Beccarianum, Petrii, Vittadinii, fulvellum.

In the United States there is only one species that is at all common, viz.: campestre, which is the American form of granulosum. It extends from coast to coast, but is most abundant in the neighborhood of the Great Lakes. The forms of mammosum, viz.: simulans and rufum, are much rarer. Tylostoma albicans (and the form Longii), pygmaeum, Floridanum and Berkeleyii are of southern distribution, the latter only occurring as far north as southern Indiana. Tylostoma occidentale, Americanum, poculatum, tuberculatum, subfuscum and Purpusii are western species. Tylostoma verrucosum, Lloydii and obesum are very rare and local forms.

The Tylostomas of the remainder of the world are very scantily known. From South Africa we have cyclophorum, and from North Africa caepitosum, montanum and volvulatum. Australian species are not well known. We have scanty knowledge of McAlpinianum, Readerii, egranulosum, albicans, subfuscum and Purpusii. The latter three occur also in America. From South America we have one (Rickii); from Asia two (Bonianum and mussooriense); from Hawaii one (Leveilleanum); from the Philippines one (pusillum). In addition exasperatum seems widely distributed in warm countries (Cuba, Brazil and India).

THE SPECIES OF TYLOSTOMA.

For convenience in classification we have divided the Tylostomas into little groups according to the most prominent characters, as follows:

Mouth definite, tubular, round, naked, more or less protruding.
  Spores smooth . . . . Group 1
  Spores not smooth.
    Cortex granular or tubercular or scaly . . . . Group 2
    Cortex not granular or tubercular or scaly.
      Stipe with strong scales . . . . Group 3
      Stipe without strong scales.
        Peridum uncolored . . . . Group 4
        Peridium colored . . . . Group 5
Mouth definite, naked, elongated, sometimes several on same peridium . . . . Group 6
Mouth with an indefinite, torn aperture, not surrounded with a fibrillose layer . . . . Group 7
Mouth surrounded with a fibrillose layer.
  Spores smooth . . . . Group 8
  Spores granular . . . . Group 9
Mouth "fimbriate" . . . . Group 10

Group 1.

TYLOSTOMA OCCIDENTALE (Plate 76).—Peridium *white,* with a small, tubular, circular, protruding mouth. Cortex adhering, separating imperfectly, largely adhering in patches to the peridium, not strongly thickened at the base. Stem pale, not scaly, strongly longitudinally striate, white internally, hollow with a central fibril. Capillitium slightly colored, with plane or oblique unthickening septa. Spores 4-5 mic., almost smooth.

This species is very close to Tylostoma albicans, but on comparison is quite different. The peridium is much whiter, the stem strongly striate, the spores smoother.

Specimens in Our Collection.

Washington, W. N. Suksdorf.

(Tylostoma armillatum of Europe, which I only know from what is published, evidently belongs to this section.)

Group 2.

TYLOSTOMA VERRUCOSUM (Plate 76).—Peridium globose, deeply colored, reddish brown, with a protruding, tubular mouth. Cortex thin, adnate, verrucose,† persistent.‡ Stem deeply colored, covered when growing with long, spreading scales which mostly fall away from dried specimens leaving the stems with short scales. Capillitium faintly colored, freely septate, not swollen at the septa. Spores 5-6 mic., *aculeate.*

This is evidently a very rare and local plant. I collected it once in company with Prof. Morgan who told me it was the first time he had seen it since the original collection some ten or fifteen years before. I have received it from no correspondent save Mr. Long, Texas, who sent two small specimens, but evidently the same species. Tylostoma verrucosum is very close to Tylostoma squamosum of Europe, having the same mouth, color, spores and stem scales, and is in my opinion the American expression of the European plant. It differs in its verrucose cortex and more robust habits.

Specimens in Our Collection.

Ohio (Preston), C. G. Lloyd; *Texas,* W. H. Long. (Note.—We have from Geo. G. Hedgcock, St. Louis, Mo., two specimens that are very close to this species and yet in some characters are quite different. We do not wish to definitely refer them to this species, nor for the present to describe them as different, so we pass them, hoping that other collections may be received that will throw more light on them.)

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† The only other species we know having this verrucose cortex is Tylostoma Leveilleanum of Hawaii. It is very much the same plant, with same spores, cortex warts, color and stem scales. We would conclude the two to be synonymous were it not that Leveilleanum is illustrated with a different mouth. None of the type specimens now preserved show this feature definitely.

‡ I have never noted any evidence that it "becomes smooth with age."

TYLOSTOMA BONIANUM (Plate 76).—Peridium reddish brown, covered with little granular, tubercular warts which in old specimens fall away leaving the peridium scarred. Mouth small, round, tubular, slightly projecting. Stem long with a deeply colored cortex disposed to tear into scales. Capillitium hyaline, rarely septate, nodes slightly swollen. Spores 5 mic., granular.

This species was described from Tonkin, China, by Patouillard, but seems to be of wide distribution. Berkeley had previously referred the same plant from Cuba (Wright—No. 500) to Tylostoma exasperatum, and I have seen what I take to be the same plant from India in the herbarium at Kew.

TYLOSTOMA MUSSOORIENSE (Plate 76).—Peridium reddish brown with very small, granular warts. Mouth small, round, tubular, slightly projecting. Stem very slender, dark colored, with small scales. Capillitium hyaline, rarely septate, nodes not swollen. Spores 5 mic., aculeate.

This plant was described by Dr. Hennings from specimens sent from India by Wm. Gollan. It is close to previous species, but has much more slender stem and much rougher spores.

Specimens in Our Collection.

India, part of the type given me by Dr. Hennings.

Group 3.

TYLOSTOMA SQUAMOSUM (Plate 77).—Peridium dark reddish brown. Cortex dark, rough (but not truly granulose as in the previous section), sometimes separating entirely from the peridium. Mouth small, tubular, round, same color as remainder of peridium or sometimes lighter color (never darker color as the mouth of T. mammosum). Stipe long, dark colored, with large scales (which are usually caducous). Capillitium hyaline, with many septa and swollen at the nodes. Spores 5-6 mic., aculeate or strongly granular.

This species is not a rare plant in the "Midi" of France, but seems more common in Germany. It is strongly characterized by its scaly stem, and deep color, and there are no grounds to consider it a form of Tylostoma mammosum, as frequently found in books. Micheli gave a crude figure of it on which Persoon based the name Tylostoma squamosum. Quelet has given a good figure of it and called it a new species, Tylostoma Barlae, but like all other "new species" of Gastromycetes of Quelet, the work was well done but the species is not new.

Specimens in Our Collection.

France, E. Boudier, L'Abbe Hue.
Belgium, Madame Rousseau.
Austria, Rev. G. Bresadola.
Hungary, Dr. L. Hollos.

TYLOSTOMA MONTANUM (Plate 77).—Pileus dark reddish brown, *large*. Cortex dark, usually persistent on lower portion of peridium. Mouth small, tubular, round. Stem dark colored, obese, with a dark cortex forming large scales. Capillitium hyaline, of slender threads, rounded and swollen at the septa. Spores 5-6 mic., aculeate.

This plant was described by Prof. Patouillard from specimens collected by himself in the higher altitudes of Tunis. It seems to me to be a large edition of Tylostoma squamosum of Europe, quite distinct in its large size and obese stem.

(Tylostoma Bresadolae, recently described from Italy, evidently belongs to this group.)

Group 4.

TYLOSTOMA ALBICANS (Plate 77).—Peridium uncolored, dirty white, with a small, tubular, circular, protruding mouth. Cortex adherent, separating imperfectly, particles adhering to the peridium, at the base of the peridium thickened and subpersistent. Stem pale or slightly colored, rough, striate but not scaly. Internally white, with central fibrils. Capillitium hyaline, slightly swollen at the joints, with a plane septum. Spores 5-6 mic., slightly asperate.

The prominent features are the uncolored peridium, the tubular mouth, the partly adherent cortex. The plant is never "smooth" and does not seem to us to be well described or figured by Miss White. However, we are assured from our study of the type specimens and the photographs we have made of them that it is the same plant that reaches us from Texas and hence use the name. We have received Australian specimens from J. G. O. Tepper that we can not separate from the Texan species.

Specimens in Our Collection.

Texas, W. H. Long, four collections, also one collection with spores slightly larger, 6-7 mic.

TYLOSTOMA LONGII.—This plant has all the general characters of the previous and from an exterior examination we can not tell them apart. The spores, however, are very small, from 2½-3 mic. Those who place much stress on microscopic characters will see in it a strong species. For us it is only a form.

Specimens in Our Collection.

Texas, W. H. Long (six collections).

TYLOSTOMA McALPINIANUM (Plate 78).—Peridium *uncolored*, with a circular, tubular, slightly protruding mouth. Cortex thick, subpersistent at the base of the peridium. Stem (relatively) thick, pale, slightly scaly. Capillitium hyaline with a very few swollen septa. Spores 5-6 mic., almost smooth.

While it is very difficult to draw up a diagnosis of the difference between this plant and Tylostoma albicans, the plants are not the same, and our photograph will show it better than our description can. This plant in general appearance very much resembles mammosum, but is *uncolored* and has almost smooth spores. Albicans belongs to a different type of plants in shape and cortex from mammosum.

SPECIMENS IN OUR COLLECTION.

Australia, D. McAlpine, J. G. O. Tepper.

TYLOSTOMA PYGMAEUM (Plate 78).—Peridium uncolored, dirty white with a small, tubular, circular, protruding mouth. Cortex adhering, separating imperfectly, particles adhering to the peridium, thickened and persistent at the base. Stem slender, pale, rough, longitudinally striate but not scaly. Capillitium hyaline, swollen at the joints. Spores 5 mic., strongly asperate.

This little species is of a southern range in the United States, and in general appearance could be described as a pygmy Tylostoma albicans. It differs from that species in its small size and rougher spores.

SPECIMENS IN OUR COLLECTION.

Texas, W. H. Long (three collections).
Florida, Theo. L. Mead, Mrs. M. A. Noble.

Group 5.

TYLOSTOMA MAMMOSUM (Plate 78).—Peridium *pale* castaneous color, *with a darker mouth, smooth.* (The cortex in the type form usually peels away entirely from the peridium; sometimes it is partly adherent.) Mouth small, tubular, protruding, *always* (in the type form) *darker than the remainder of the peridium.* Stem slender, pale or dark castaneous,† smooth or striate, *very slightly* if at all scaly. Capillitium subhyaline, with frequent strongly swollen septa. Spores 5 mic., granular.

The typical form of Tylostoma mammosum with its small, smooth head and dark mouth is the most frequent species in Europe,‡ but *does not occur* in America.§

It is the only species that I know in England, and is frequent in France, Germany, Sweden and northern and central Europe generally. In Italy it appears to be replaced mostly by other species.

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† In some collections notably darker than others.

‡ We have received twelve collections. There are twenty-one in the general herbarium, Museum of Paris, thirty-one at Kew, nineteen at the British Museum, thirty-one at Berlin, a dozen sheets in Persoon's herbarium, all typically this same little plant, which is quite common and very constant in Europe.

§ It has been the custom in America to call everything with a portruding mouth Tylostoma mammosum. No plant grows there that corresponds entirely to the European plant. Miss White industriously collects the records and presents a table showing that Tylostoma mammosum occurs in sixteen different states. It is doubtful if she ever saw a specimen from America that could not be distinguished from the European. A form does occur in America that is close to the European, but it is very rare. The usual form in America is quite different.

SYNONYMS.—This plant is exactly Tylostoma brumale of Persoon, as evidenced by numerous specimens in his herbarium.† Tylostoma melanocyclum (Ann. Myc. 1904, page 415) appears to me to be this plant. Tylostoma pedunculatum is purely a juggled name.‡

SPECIMENS IN OUR COLLECTION.

France, X. Gillot, M. Barbier, Rev. H. Bourdot, E. Boudiere, L'Abbe Hue, N. Patouillard.
Italy, M. Bezzi.
Austria, Rev. G. Bresadola, J. Brunnthaler.
Switzerland, D. Cruchot.
Hungary, Dr. L. Hollos.
Belgium, C. Van Bambeke.

FORMS OF TYLOSTOMA MAMMOSUM.

There are several plants closely allied to Tylostoma mammosum in general size, habits, etc., but which differ on comparison. I fear that I shall not be able to make the difference clear even with the aid of the camera.

EUROPEAN FORMS.

TYLOSTOMA BREVIPES.—This is a unicolored form, both stipe and peridium differing from Tylostoma mammosum principally in color and in not having a different colored mouth. The septa, as in the type form, are strongly swollen. It was originally described from Italy, and while I have seen no authentic specimens, it seems to me that the plants I have received from France agree with the description, but I may be mistaken and therefore do not present a plate of it.

SPECIMENS IN OUR COLLECTION.

France, Capt. Pyat Felix.

TYLOSTOMA PALLIDUM (Plate 79).—This form has a unicolorous *pale* pileus, and more adnate cortex. It has also a larger peridium and a relatively thicker stem. The capillitium is quite different from the type form (hence to those who place stress on capillitium characters, it is a new species). The septa are rare and very slightly swollen.

SPECIMENS IN OUR COLLECTION.

France, Capt. Pyat Felix.
Italy, Prof. C. Massalongo.

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† While we use the name Tylostoma mammosum, that being the name under which the plant has been generally known since the appearance of Fries' Systema, and (use makes language), the just name would be Tylostoma brumale. There is not in the history of modern name changing a more unjust change than that of Fries when he proposed Tylostoma mammosum. When Fries wrote his Systema the plant was commonly known as Tylostoma brumale, as is evidenced in all the old herbaria and in the illustration that he cites. If Fries did not know it he could easily have found it out. To cite "Lyc. mammosum! etc.; Mich. gen." as an excuse to justify the change was simply a pretext for Micheli never called the plant "Lycoperdon mammosum" or anything "mammosum." It was only one of seven descriptive adjectives Micheli applied to it, neither the first nor the last, and apparently to Micheli's mind an unimportant one for he puts it intermediate and in parenthesis.

‡ While it is possible, even probable, that "Lycoperdon pedunculatum" is this plant, Linnaeus left no specimen and it is not sure. Besides there is no reason to displace a name that has been generally applied to the plant for eighty years in favor of an old, doubtful name, dug up from Fries' synonyms with a date dictionary.

TYLOSTOMA SIMULANS (Plate 79).—Peridium pale, castaneous color, with mouth unicolorous. Cortex thin, separating imperfectly. Stem slender, pale, slightly striate and sometimes slightly scaly. Capillitium rarely septate with thickened nodes. Spores 5 mic., asperate.

This is the nearest approach we have in America to Tylostoma mammosum of Europe, and it is a rare plant. On comparison it differs in its unicolorous and more deeply colored peridium, more adnate cortex and paler stipe.

SPECIMENS IN OUR COLLECTION.

Ohio (Granville), W. W. Stockberger; (Sandusky), H. C. Beardslee.
Texas, W. H. Long.

TYLOSTOMA RUFUM (Plate 79).—Peridium deeply colored, reddish brown, with a circular, tubular, strongly protruding mouth. Cortex thin, adhering, but separating perfectly from old specimens, leaving the peridium perfectly smooth. Stem deeply colored, covered with short scales, internally white with central fibrils. Capillitium faintly colored, not swollen at the septa. Spores 5 mic., granulose.

This species has been, I am sure, usually determined as Tylostoma mammosum in the United States. Miss White's Fig. 1, Plate 31, is very good of it. It differs from Tylostoma mammosum of Europe in its more deeply and uniformly colored and larger peridium, its short, thick, scaly stem and in its capillitium nodes.

SPECIMENS IN OUR COLLECTION.

Texas, W. H. Long (four collections).
Florida, Mrs. Delia Sams.
Alabama, A. S. Bertolet.
Iowa, Prof. T. H. McBride.

TYLOSTOMA PURPUSII (Plate 79).—Peridium pale, castaneous color, darker at the mouth, with a circular, tubular, protruding mouth. Cortex partly adherent at the base but mostly freely separating, leaving the peridium smooth. Stem colored, rough but not scaly. Capillitium subhyaline, the septa rare, those of the smaller branches swollen but of the large branches very slightly. Spores 5 mic., asperate.

This species can easily be taken as a giant form of Tylostoma mammosum. It is a rare plant and I have seen from America only the type specimens at Berlin, which were collected in Colorado by a Mr. Purpus. We refer here (for the time at least, rather than make a new species) plants from Australia with the same general characters, but which differ in more persistent cortex and the spores, which in the Australian specimens vary from 4 to 7 mic.

SPECIMENS IN OUR COLLECTION.

Colorado, type from museum at Berlin.
Australia, D. McAlpine (specimens collected by F. M. Reader).

TYLOSTOMA FLORIDANUM (Plate 80).—Peridium *dark castaneous* color, with a small, tubular, circular, protruding mouth. Cortex separating imperfectly, particles adhering to the peridium, thickened and subpersistent below. Stem slender, *dark reddish brown*, subsmooth, substriate with no trace of scales, white within, hollow with central fibrils. Capillitium subhyaline, sometimes waxy with septa both swollen and even. Spores 5 mic., strongly asperate.

This little species seems to be of a southern range, reaching me only from Florida. The slender, very dark colored stem and the colored peridium distinguish it from all related species.

SPECIMENS IN OUR COLLECTION.

Florida, Mrs. Delia Sams, Mrs. M. A. Noble, Theo. L. Mead.

(Tylostoma Giovanellae and Tylostoma Beccarianum, rare plants in Europe. Tylostoma Wrightii of New Mexico and Tylostoma Wrightii of India, all imperfectly known to me, belong to this section, I think.)

Group 6.

The three following species are very close to each other (if not the same). They are distinguished by their obese habits, pale color and the mouths which are naked, very slightly protruding and usually not circular but elongated in form. The plants usually do not have a single central mouth, as other species, but many specimens develop several mouths, irregularly disposed.

TYLOSTOMA VOLVULATUM (Plate 81).—Peridium uncolored, usually very pale, with a naked, slightly protruding, usually irregular mouth. Sometimes (I am told) it develops more than one mouth, though I have never noted such specimens. Stem obese, pale, usually rough with adhering sand. Capillitium *colored*.† Spores smooth, 5 mic.

This species is well named and is often well marked by remains of the stem volva adhering as a distinct collar at the base of the peridium and also at base of stem as shown in Plate 81, Fig. 4. It is an abundant plant in northern Africa and well represented in the museums of Paris and Berlin.

SYNONYMS.—Tylostoma tortuosum (Fr. Syst. Myc. 3-43) much the prior name, which was not adopted but referred to his synonymy by Dr. Hôllos, no doubt because it did not make a "new combination." Tylostoma volvulatum, which is in general use, is a much better name for it. The following are also synonyms according to Prof. Patouillard: Tylostoma Boissieri (Rev. Myc. T. xv, f. 2), Tylostoma Barbeyanum (Bull. Bois. 1, 99). Also in my opinion Tylostoma Ruhmeriana (Hedw. 98, 288).

SPECIMENS IN OUR COLLECTION.

Africa, collected by Schweinfurth and given us by Dr. Hennings.

TYLOSTOMA CAESPITOSUM (Plate 80).—Peridium uncolored, pale, usually with *several* naked, irregular mouths. Stem obese, colored, striate. Capillitium hyaline. Spores slightly granular.

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† The gleba of this species is notably darker in color than that of most Tylostomas and the capillitium is distinctly colored, not "hyaline" as stated by Petri.

This is a very rare species, known from only a few localities in northern Africa. It is very close to volvulatum, but the gleba is notably of a lighter color and (under the microscope) is hyaline.

Specimens in Our Collection.

Tunis, Doctor X. Gillot, "In the sand close to the sea near Tunis."

TYLOSTOMA AMERICANUM (Plate 80).—Peridium uncolored, pale, often with several irregular, naked, protruding mouths. Stem obese, pale or light colored, hollow, often striate, varying much in thickness and length, from two to six inches long. Capillitium hyaline. Spores 5-6 mic., smooth.

This plant was collected in great abundance in the vicinity of Denver, Colorado, by E. B. Sterling. In my opinion it is only an American form (hence the name) of Tylostoma caespitosum of North Africa, although the spores are not the same and it is a much more robust plant.

SYNONYMS.—In my opinion Tylostoma Kansense is the same plant, although I do not use the name, as Prof. Peck (to whom I sent specimens of the Denver plant) strongly disagrees with me, and Patouillard and Bresadola have coincided with Prof. Peck. They form their opinions from the darker color of the capillitium, which I readily agree is slightly darker in the Kansas specimens. The specimens Mr. Bartholomew sent me are old, wintered specimens, and I think that explains not only the darker capillitium but also the *different mouth* of T. Kansense as described.

Specimens in Our Collection.

Colorado, E. B. Sterling, in great variety and abundance.
Nebraska, Rev. J. M. Bates.
Kansas, E. Bartholomew (confirmed by Prof. Peck as Tylostoma Kansense).

Group 7.

TYLOSTOMA RICKII (Plate 81).—Peridium *dark, reddish brown*, with thin cortex. Mouth an irregular, torn aperture. Stem dark, reddish brown, with a fibrillose, dark, sheath-like cortex which becomes torn and lacerate on the stem and partially persists forming a strong collar at base of the peridium. Capillitium hyaline, appearing as flattened, ribbon-like, twisted threads. Septa rare, not swollen. Spores 5 mic., *aculeate* (long but not dense spines).

This species is close to cyclophorum of South Africa in general appearance, color and stem collar, but has entirely different mouth. Collected in Brazil by Rev. J. Rick.

Specimens in Our Collection.

Brazil, Rev. J. Rick.

TYLOSTOMA AUSTRALIANUM (Plate 81).—Peridium uncolored, with sand-case cortex, irregularly peeling off and persistent at the base. Mouth an irregular, torn aperture. Stem short, with a dark, rough, not scaly cortex. Capillitium hyaline, slender threads. Septa few, strongly swollen. Spores 4-5 mic., smooth.

This, judging from the collections I have received, is the most common species in Australia. It has a large head and a short stipe, and in general appearance is the same as Tylostoma album (type specimen at Kew), but it has smooth spores (strongly granular in T. album).

SPECIMENS IN OUR COLLECTION.

Australia, Prof. D. McAlpine (four collections).

TYLOSTOMA READERII (Plate 82).—Peridium uncolored, firm, white. Cortex of the nature of a sand-case, peeling off imperfectly and persistent at the base. Mouth an elongated, torn opening. Stipe long, dark, rough, but not scaly, frequently with mycelial fibrils. Capillitium hyaline, broad threads. Septa rare with rounded ends and not swollen. Spores 5-6 mic., granular.

This plant has a general resemblance to Tylostoma granulosum, but has not the same mouth. Specimens collected by F. M. Reader at Casterton, Australia.

SPECIMENS IN OUR COLLECTION.

Australia, F. M. Reader.

TYLOSTOMA EGRANULOSUM (Plate 82).—Peridium uncolored, with an irregular, torn aperture. Cortex as a sand-case imperfectly separating, thickened and persistent at the base. The cortex does not separate as freely as most species but adheres with a "pitted" effect on the peridium. Stipe dark, rigid. Capillitium subhyaline, with rare but swollen nodes. Spores 5-6 mic., granular.

This plant is very close to Tylostoma granulosum of Europe, but the mouths of these specimens are not furnished with "granular fibrils."

SPECIMENS IN OUR COLLECTION.

Australia, D. McAlpine, F. M. Reader.

Group 8.

TYLOSTOMA POCULATUM (Plate 83).—Peridium smooth, pale, with a strongly raised, shield-shaped fibrillose mouth. Cortex thick, breaking away *perfectly* from the peridium which it leaves *perfectly smooth* excepting at the base where the thick cortex persists as a kind of cup. Stem pale or slightly colored, sulcate, striate, not scaly, usually thickened below (sometimes strongly) with the mycelial, adnate sand. Capillitium subhyaline, or sometimes distinctly colored, sparingly septate, with slightly thickened septa. Spores 5 mic., *smooth.*

This is a most peculiarly marked species, both in its mouth and cortex characters and we know no other species having either of the characters so strongly marked. It occurs chiefly in our western states, but we have it also from Australia. No form is known in Europe. Tylostoma minutum is, in my opinion, based on a small specimen of it. It varies in two features, color and roughness of the spores, and plants so varying have been called species, but to my mind they are so close that they may better be called forms.

Specimens in Our Collection.

Nebraska, Rev. J. M. Bates.
Colorado, E. B. Sterling (four collections).

FORMS OF TYLOSTOMA POCULATUM.

TYLOSTOMA TUBERCULATUM (Plate 83).—We find specimens agreeing with Tylostoma poculatum in general characters, and so close to it they can not be distinguished except by the microscope, that differ in having spores not smooth, but granular. For us it is a form, but for those who give their species no latitude as to *spore variation* it is a strong species. We are not sure it is Miss White's plant, as we would describe the spores as "granular" instead of with "occasional tuber-like warts," but we prefer to use her name rather than to propose a new one.

Specimens in Our Collection.

Washington, C. V. Piper.
Illinois, A. S. Bertolet.
Texas, W. H. Long.

TYLOSTOMA SUBFUSCUM (Plate 83).—The usual color of Tylostoma poculatum is pale tan but sometimes collections are dark chocolate brown. Sometimes both colors occur in same collection and I have noted all shades of connecting colors. The extreme color form, however, is very marked. Spores are granular in all we have examined.

Specimens in Our Collection.

Nebraska, Rev. J. M. Bates.
Minnesota, Minn. Bot. Survey.
Florida, C. E. Pleas (two collections), Theo. L. Mead (a very small form).
We have this exact plant also from Australia, Prof. D. McAlpine.

TYLOSTOMA LLOYDII (Plate 83).—Peridium dark, reddish-brown, with a thin, closely adnate cortex, which separates perfectly above but persists closely adnate at the base. Mouth at first *raised, shield-shaped,* fibrillose, In old specimens these fibrils are worn away, leaving the mouth a naked, round, plane opening.† Stem *long,* slender, with a dark, scaly cortex.‡ Capillitium slightly colored, subhyaline, narrow threads with slightly thickened nodes. Spores *smooth,* 4 mic.

This is apparently a very rare and local form but is strongly different from any other species known to me. Prof. W. H. Aiken collected the plants several years ago in the vicinity of Cincinnati, Ohio, and brought the specimens to me. I sent some to Rev. Bresadola who decided it to be undescribed and published it recently (Ann. Mycologici, 1904, page 423).† I have never received specimens from any other collector.

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† The figure in Petri's paper was made from an old specimen and does not show the true character of the mouth.

‡ The only collection known was old, wintered specimens and the stem scales are small, but I think fresh specimens will be found to have a strongly scaly stem.

TYLOSTOMA OBESUM (Plate 83).—Peridium uncolored with a raised fibrillose mouth. Cortex separating freely, leaving the peridium smooth. Peridium with a marked collar at base. Stipe thick, obese. Capillitium strongly colored. Spores smooth.

Known from a single collection from Colorado. The type is at Kew but a better specimen (Plate 83, Fig. 7) is in Ellis' collection at New York.

(Tylostoma fulvellum, a recently described plant of Europe, Tylostoma MacOwani of South America and Tylostoma gracile, which I have been unable to recognize, from United States, all evidently belong to this group.)

Group 9.

TYLOSTOMA GRANULOSUM (Plate 84).—Pileus *uncolored*.‡ Cortex of the nature of a sand-case, separating above, leaving the pileus smooth, persistent at base of peridium. Mouth with a small development of fibrils, usually torn and granular in appearance. Stipe dark, striate-sulcate, usually rather short and thick. Sometimes numerous mycelial fibrils adhere to stems as collected. Capillitium subhyaline, with few septa, not swollen. Spores 5-6 mic., granular.

We refer to Tylostoma granulosum all collections we have seen from Europe that do not have a tubular mouth. The European plants all agree in the main characters, viz.: an *uncolored* peridium; the same mouth surrounded at first by a slight development of fibrils which usually from the impress of the sandy cortex are *granular* in appearance and in old specimens usually disappear, and granular spores. The plant varies chiefly in stature. The usual form as shown, Plate 84, Fig. 4, corresponds to Leveille's figure. Sometimes it is more obese, Plate 84, Fig. 3, and rarely it is more slender, Plate 84, Fig. 2. The slender form appears to me to be the plant that has been figured under the name Tylostoma Petrii. The capillitium of the latter form, under the microscope, is slightly colored. Tylostoma granulosum is widely distributed and fairly frequent in Europe, but I have seen no specimens from England. In Italy it appears to be the most common species.§

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† Rev. Bresadola kindly named the plant Tylostoma Lloydii and sent me a diagnosis for publication in Mycological Notes. After filing it for a couple of years I returned it to Rev. Bresadola stating it would embarrass me to publish it. There will be no more "Lloydii's" published in Mycological Notes.

‡ The word "brunneo" in Saccardo seems to have been added. It is not in the original description and Leveille's drawing and specimens are uncolored. The plant of Europe is in my observation always uncolored, and I have not the source of the opinion so prevalent that Tylostoma granulosum has a colored peridium, as shown in Petri's recent drawings. I am well satisfied there is no species in Europe with a fibrillose mouth and a colored peridium.

§ Vittadini (usually very accurate in his work) gave an illustration of Tylostoma granulosum under the name Tylostoma mammosum (which has an entirely different mouth), and his misnamed picture has been copied by Fischer in Engler and Prantl as Tylostoma mammosum. It belongs to a different section of the genus. At the British Museum I found seven exsiccatae (mostly Italian) with specimens of Tylostoma granulosum misnamed Tylostoma mammosum.

SYNONYMS.—Leveille gave a beautiful figure of the plant and we adopt the name as we are certain of it and it impresses us as being appropriate on account of the "granular mouth." Fries, we think, called the same plant (at a prior date) Tylostoma fimbriatum, but we are not certain of it,† and the name has no application to any European species.‡ It is quite probable that Czerniaiev's illustration Tylostoma brachypus refers to this species, though to us it seems a better illustration of the American form (Tylostoma campestre).

SPECIMENS IN OUR COLLECTION.

France, E. Boudier (also obese form), L Rolland, L'Abbe Hue, N. Patouillard, Capt. Pyat Felix (we have also from Capt. Pyat Felix the slender form, T. Petrii).

Germany, Dr. Hennings, Prof. Magnus, Prof. Plöttner (also from Dr. Hennings an obese form).

Austria, Rev. G. Bresadola.

Hungary, Dr. Hollos.

TYLOSTOMA CAMPESTRE (Plate 84).—I do not feel that it is possible to consider this as other than the American form of Tylostoma granulosum. I do not know of a single character to distinguish it. And yet on comparing collections of the American and European plants a general difference is usually seen. The American plant is more robust, the heads are globose and firmer, the cortex peels off more freely in the American plant and does not adhere to the base so strongly. While we believe we could in most cases guess correctly whether a collection was American or European, we would not guarantee to do it in all instances. A plant that does not typically present a single marked character by which it can be known is not a species.§ We have a few collections that grew in the sand and have more slender stems with mycelial strands strongly developed. This we take to be Tylostoma fibrillosum, but for us it is a condition not a species. A form collected by Mr. Bartholomew, Kansas, is closer to the European plant in stature than to the American, and some specimens have little depressions in the peridium. It was called Tylostoma punctatum.††

Tylostoma campestre is the most common species in the United States and the only one that is at all frequent east of the Mississippi. It is most abundant in the neighborhood of the Great Lakes.‡‡

SPECIMENS IN OUR COLLECTION.

California, A. P. Morgan (type), L. A. Greata.

Colorado, E. Bethel.

Nebraska, Rev. J. M. Bates (five collections).

Kansas, E. Bartholomew (labeled T. punctatum).

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† Fries' type specimen is misplaced now and we were unable to find it at Upsala. It was sent to Paris a few years ago and Patouillard who has seen it tells me that in his opinion it is the same plant. Besides, we have no other species in Europe it can possibly be. Both species are carried in most European works, but recent authors, Hollós and Petri, get their ideas of "fimbriatum," we think, not from European plants but from American specimens.

‡ The name "fimbriatum" is a misnomer as applied to any Tylostoma; but in the sense in which it is applied to Geaster mouths, there are such species from South America but none in Europe. I am sure there is no such plant in Europe with a mouth as shown in Hollós, enlarged illustration. I think he drew the picture to suit the idea. Petri's recent picture was made (I think) from American material.

§ The key character given in Miss White's paper "mouth plane" and shown in her figure is evidence that she only knew old mouths. The normal mouth is exactly the same as typical granulosum.

†† The "irregular shallow pits" on the peridium are imprints of granular particles of the sandy cortex and are present and absent in the same collections, both American and European. They are shown grossly exaggerated in Miss White's drawing.

‡‡ I collected it very abundantly one season close to Lake Michigan. It grew in a sandy pasture, in one spot only, covering only a few feet, but as thick as they could stand. Horses had evidently been in the habit of resting there in the shade. Czerniaiev states that the Russian plant grows in soil impregnated with urine and the only time I collected the plant the circumstances tended to confirm this.

Michigan, B. O. Longyear (two collections), David L. James (two collections), C. G. Lloyd (very abundantly).

Illinois, L. H. Watson (three collections), W. S. Moffatt (two collections).

Wisconsin, R. H. Denniston.

Minnesota, Mary S. Whetstone.

Canada, J. Dearness (three collections), A. S. Bertolet.

Maryland, Chas. McIlvaine. I have also seen specimens on Hollis Webster's table from Massachusetts (if I remember rightly).

TYLOSTOMA BERKELEYII (Plate 84).—Peridium *colored,* reddish brown. Cortex nature of a sand-case, separating usually imperfectly and much more strongly adnate than the previous species. Mouth surrounded by a few granular fibrils (the same as the previous plant). Stem *slender,* dark reddish, often slightly scaly, usually strongly sulcate, striate. Capillitium light colored with slightly swollen often oblique septa. Spores 5-6 mic., granulose.

This plant occurs in the southern United States, and is the species referred to in American literature as Tylostoma fimbriatum, surely a misnomer, for no similar plant grows in Europe. It was Berkeley, I think, who first thus determined the American plant, and hence we name it in his honor.† This species corresponds to the European only in its mouth and spore characters. It differs in being a *colored* plant and having a large head and slender stem. A splendid illustration of the plant was given by Petri (Ann. Mycologici, 1904, Plate 6) under the name of Tylostoma fimbriatum, and drawn, we think, from American specimens.

SPECIMENS IN OUR COLLECTION.

Florida, Theo. L. Mead (two collections), H. C. Culbertson.

Alabama, F. S. Earle.

Washington, D. C., F. J. Braendle.

Indiana, H. B. Dorner.

TYLOSTOMA CYCLOPHORUM (Plate 85).—Peridium light brownish color, with a raised, shield-shaped, fibrillose mouth. Cortex thin, separating perfectly, leaving the peridium smooth. In old plants very little of the cortex remains attached at the base of the peridium. Stem slender, dark, with a strong, fibrillose, dark cortex, which becomes lacerate and strongly persists at the base of the peridium, forming a lacerate collar. Capillitium colored, thick (3-4 times diameter of spores), with thick walls and numerous slightly swollen, colored nodes. Spores 4-5 mic., granulose.

These specimens were received from Miss B. Stoneman, South Africa. The plant is very similar to Tylostoma Rickii of South America in general apearance and particularly in the strong, fibrillose cortex of the stem remaining as a conspicuous collar at base of the peridium. It differs in all its other characters.

SPECIMENS IN OUR COLLECTION.

South Africa, Miss B. Stoneman.

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† The custom of naming plants after authors who misname them is a kind of back-handed compliment frequently handed out in mycology.

TYLOSTOMA EXASPERATUM (Plate 85).—Peridium furnished with large, black, conical warts, which fall away leaving the peridium scarred with circles of small warts which surround the large ones.† Mouth raised, fibrillose. Stem with strong scales. Capillitium slender (not exceeding diameter of spores), hyaline, rarely septate with unswollen nodes. Spores 6-7 mic., very strongly aculeate, and (in some species) faintly reticulate.

This species is very different from all that precede in its strong, warty peridium, its strong, spinulose spores and in its habitat. It grows on branches and rotten wood (sometimes in the ground) and was originally described from Cuba, but is probably widespread in the tropics. We have seen specimens from Cuba, India and Brazil. It has also been reported from Australia but we have seen no specimens from Australia. Tylostoma Ridleyi (Kew Bulletin, 99, 173) is a synonym.

SPECIMENS IN OUR COLLECTION.

Brazil, Rev. J. Rick.

(Tylostoma pusillum [Hook. Jour. 46, 157] is evidently a very similar plant as to habitat and spores. The cortex warts are much smaller and the mouth we were unable to make out from the type specimens. It was collected in the Philippines.)

TYLOSTOMA LEVEILLEANUM (Plate 85).—Peridium colored, with a thin, adnate cortex, breaking up into little scale-like warts. Mouth (?).‡ Stem thick,§ strongly scaly. Capillitium subhyaline, with rare, unswollen septa. Spores 5-6 mic., *strongly aculeate.* This plant was collected in Hawaii many years ago by Gaudichaud, and was described and named by Leveille.†† The type specimens, dry and in alcohol, are in the museum at Paris. There are some better specimens collected in Hawaii by Drummond, at the British Museum.

SPECIMENS IN OUR COLLECTION.

Hawaii, part of the type collection by Gaudichaud, given us by P. Hariot.

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† This is exactly the same general nature of cortex as Lycoperdon gemmatum, though very different warts.

‡ None of the specimens at Paris now show the mouth character, but in the original drawing it is depicted as being simply an irregular aperture.

§ In the original drawing the stem is shown much thicker than in the alcoholic specimens from which our plate has been prepared. There are also some mounted specimens at Paris with thicker stems.

†† The claim has been made that the plant was named by Gaudichaud which does not seem possible to me. He was not a mycologist and would not have known a Tylostoma from a Peziza. Besides his original drawing has today the sole name "Fungus Isles Sandwich."

APPENDIX.

The genus Tylostoma seems to be the most plastic, and is the most difficult genus in the puff ball world. Many collections reach us that we do not feel justified in naming, either because the specimens are old and characters have disappeared, or they do not accord with any species that we know. Some of them are strongly marked, but we feel it is not advisable to unduly multiply the species nor to base "new species" on a single collection unless it is ample in number and presents marked characters.

At the present time the following collections remain unnamed in our museum: W. H. Long, Texas (13); T. L. Mead, Florida (2); Geo. G. Hedgcock, Missouri (1); F. K. Vreeland, Colorado (1); F. K. Vreeland, New Mexico (2); D. Griffiths, Arizona (2); R. H. Stevens, Colorado (1); J. M. Bates, Nebraska (1); Chas. McIlvaine, New Jersey (1); John W. Harshberger, Pennsylvania (1); W. S. Moffatt, Illinois (2); C. E. Brown, Wisconsin (1); Minn. Bot. Survey, Minnesota (1); J. G. Lamison, Ohio (1); W. C. Dawson, Ohio (1); L. R. Waldron, North Dakota (1); S. B. Parish, California (4); Mrs. Blanche Trask, California (1); L. A. Greata, California (1). Total, 38.

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(Those marked * are better called forms or varieties.)

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Paris, July, 1906.

Dear Sir,—I am sending you by this mail a copy of "The Tylostomeæ," a complete account of the known species of the world. I trust it will arrive safely.

I hope I am not imposing on you in asking that you will send to me this season such specimens of the Polyporii as may come to your notice. There are no special directions for collecting Polyporii excepting that ample specimens should be collected (not little fragments), and if moist they should be well dried. If growing on wood it is well to enclose a ticket with each, giving the name of the wood, as "oak," "maple," etc., on which you find them. Also make a memorandum on the ticket if you note any decided odor when fresh, as "fragrant," "anise," etc., or if you note any change of color when touched or in drying. There are species of Poria that are yellow when fresh, but change to red when dry; also those which are white when fresh, and change to red when bruised.

While I expect to devote the next few years to a study of the Polyporii, I shall be glad to receive from you any specimens of a hard, firm nature, such as Corticium, Stereum, Thelephora, or of any fungi of a firm, cartilaginous, or woody nature. I do not claim to know all these plants now, but any specimen that preserves its characters when dry will be gladly received and preserved in our museum for the benefit of future study.

I ask, however, that you do *not* send specimens of the *fleshy fungi* such as Agaricus, Boletus, Clavaria, etc., unless they are of a tough nature and preserve their characters when dried, as Lentinus, Panus, etc.

I hope you will lay aside such specimens as you may note the present season, and at the close of the season send them to my address as below. I expect to remain in Europe during the collecting season, but shall return to America at the close of the season, where I trust I may find a shipment from you. It is well to number your specimens and keep a duplicate to correspond, and when they come into my hands I will advise you the names as far as I may know them.

Yours truly,
C. G. Lloyd,
Court and Plum Sts.,
Cincinnati, Ohio.

K.

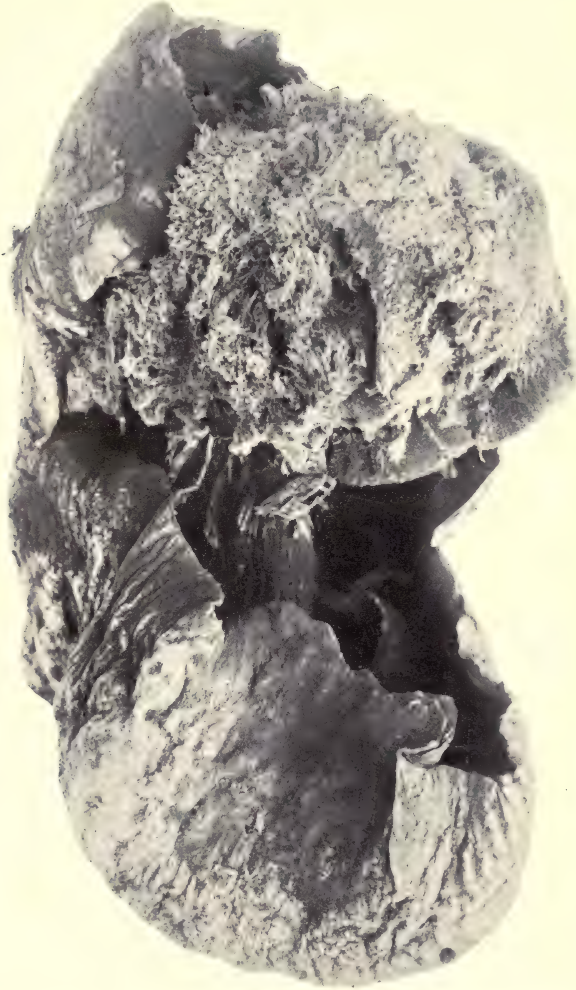

Fig. 1.

Plant partially enclosed in the volva. Type specimens in museum at Paris.

BATTARREA GUICCIARDINIANA.

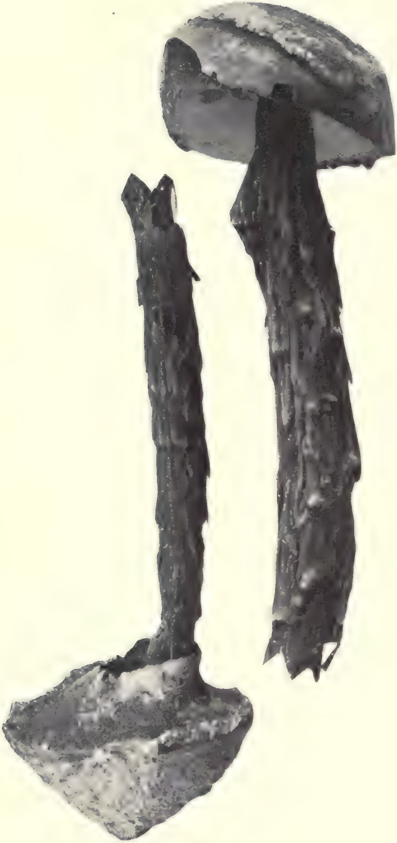

Fig. 2.

A mature plant. Type specimen in museum at Paris.

BATTARREA GUICCIARDINIANA.

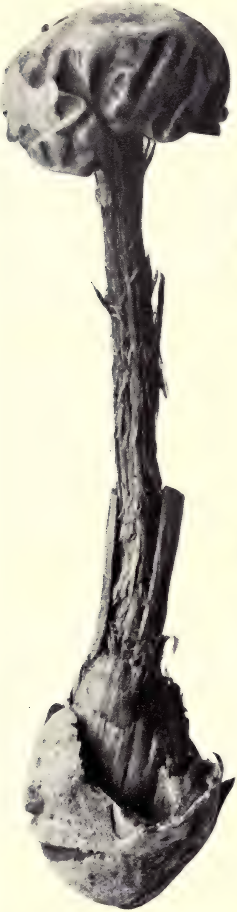

Fig. 1.

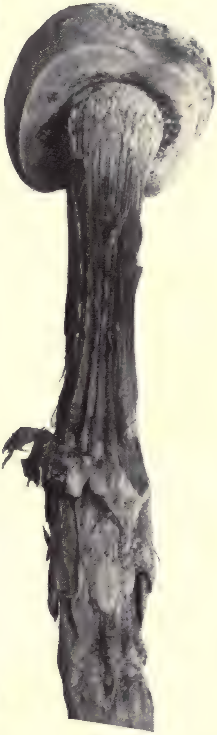

Fig. 2.

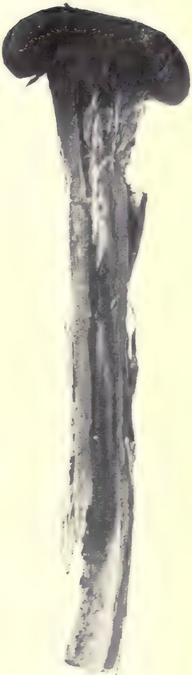

Fig. 3.

Fig. 1, type specimen in museum at Paris. Figs. 2 and 3, specimens in collection of Professor L. M. Underwood (type of Battarrea Griffithsii).

BATTARREA DIGUETI.

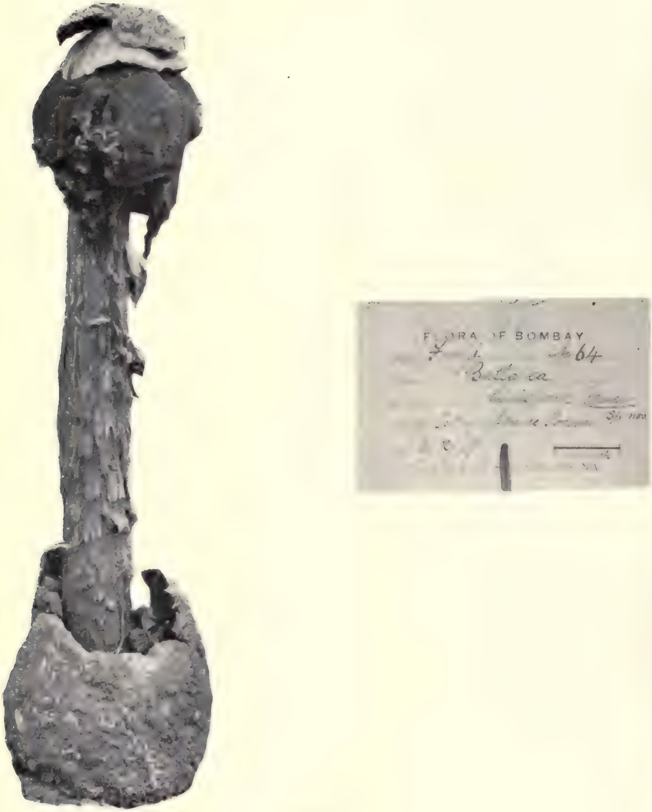
FLORA OF BOMBAY
64
Sp. nov.

Fig. 4.

Type specimen and label from a photograph given by Professor George Massee.

BATTARREA LEVISPORA.

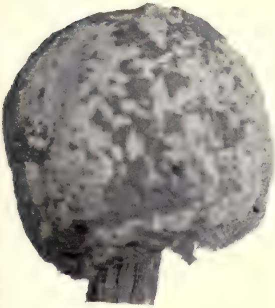

Fig. 1.

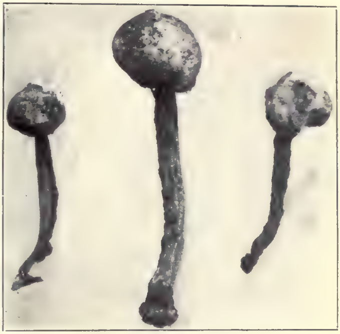

Fig. 2.

Fig. 1, enlarged. Fig. 2, specimens from W. N. Suksdorf, Washington.

TYLOSTOMA OCCIDENTALE.

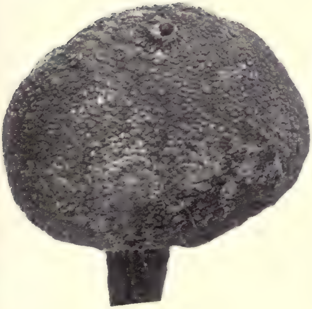

Fig. 3.

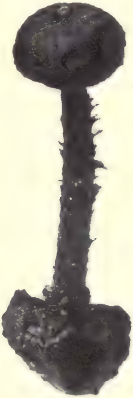

Fig. 4.

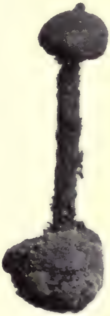

Fig. 5.

Fig. 3, enlarged. Figs. 4 and 5, specimens from near Cincinnati.

TYLOSTOMA VERRUCOSUM.

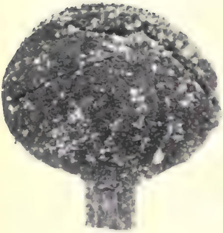

Fig. 6.

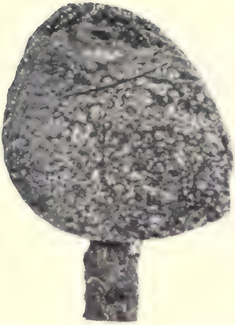

Fig. 7.

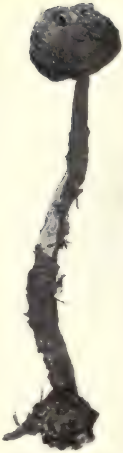

Fig. 8.

Figs. 6 and 7, enlarged. Fig. 8, natural size. All type specimens in herbarium of Professor Patouillard and Museum of Paris.

TYLOSTOMA BONIANUM.

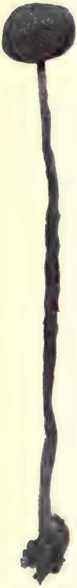

Fig. 9.

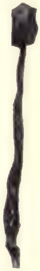

Fig. 10.

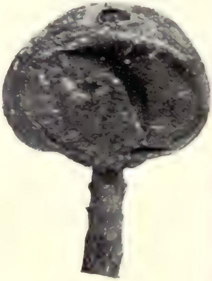

Fig. 11.

Figs. 9 and 10, natural size. Fig. 11, enlarged. Type specimen in museum at Berlin.

TYLOSTOMA MUSSOORIENSE.

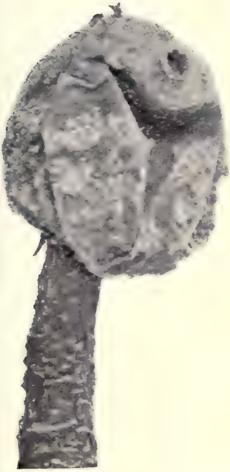

Fig. 1.

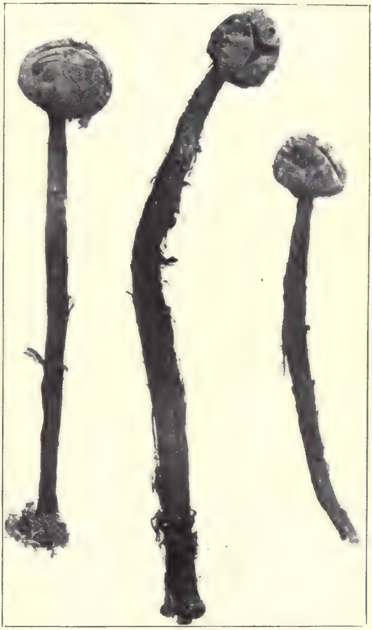

Fig. 2.

Fig. 1, enlarged. Fig. 2 specimens from E. Boudier, France, and Rev. G. Bresadola, Tirol.

TYLOSTOMA SQUAMOSUM.

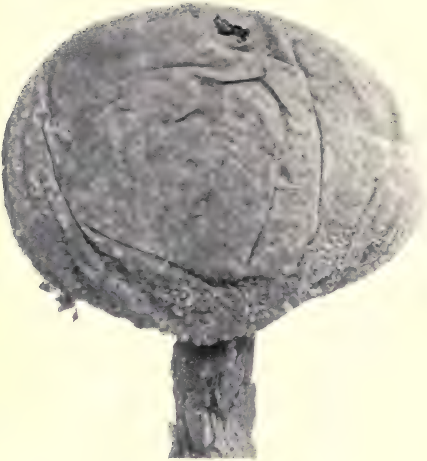

Fig. 3.

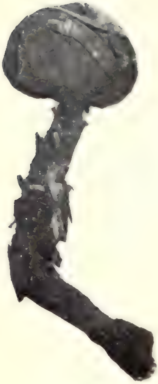

Fig. 4.

Fig. 3, enlarged. Fig. 4, type specimen in herbarium of Professor Patouillard.

TYLOSTOMA MONTANUM.

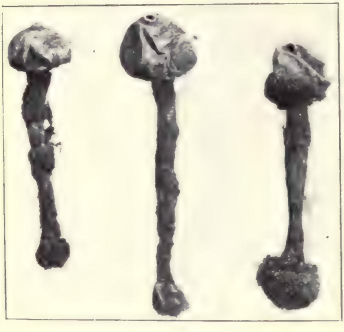

Fig. 5.

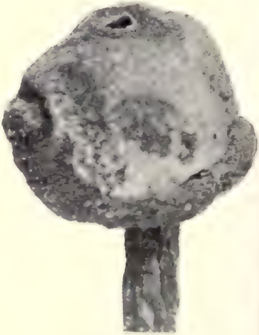

Fig. 6.

Fig. 5, specimens from W. H. Long, Jr., Texas. Fig. 6, enlarged.

TYLOSTOMA ALBICANS.

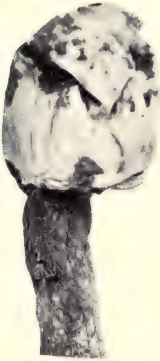

Fig. 1.

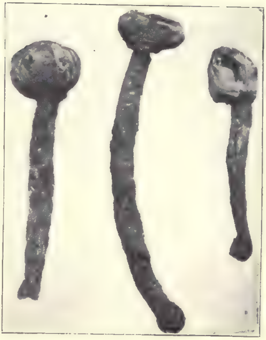

Fig. 2.

Fig. 1, enlarged. Fig. 2, specimens from Professor D. McAlpine and J. G. O. Tepper, Australia.

TYLOSTOMA McALPINIANUM.

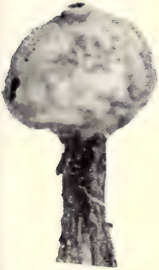

Fig. 3.

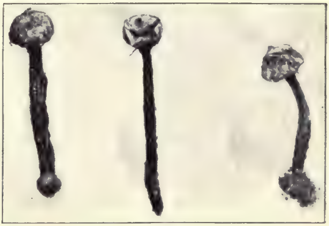

Fig. 4.

Fig. 3, enlarged. Fig. 4, specimens from Theo. L. Mead, Florida.

TYLOSTOMA PYGMAEUM.

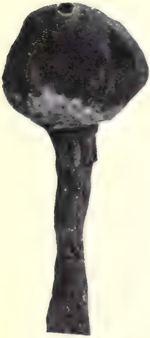

Fig. 5.

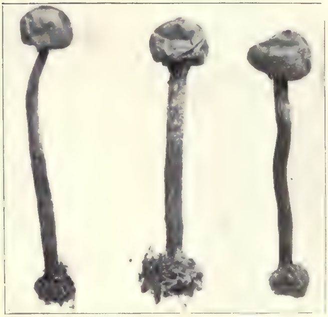

Fig. 6.

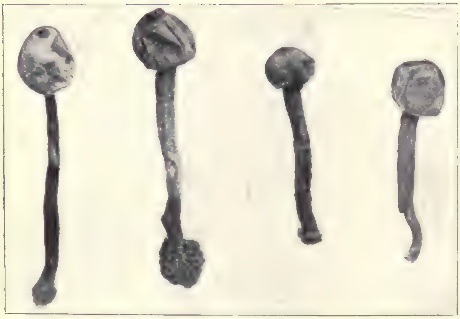

Fig. 7.

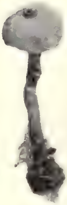

Fig. 8.

Fig. 5, enlarged. Figs. 6, 7 and 8, specimens from eight different collections from various parts of Europe.

TYLOSTOMA MAMMOSUM.

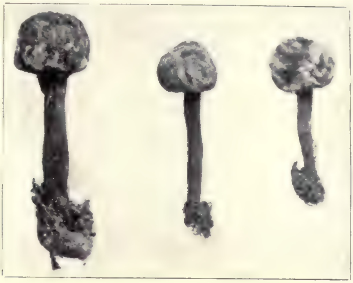

Fig. 1.

Specimens from Captain Pyat Felix, France.

TYLOSTOMA PALLIDUM.

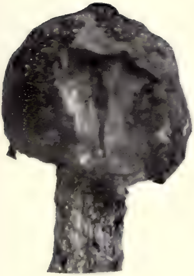

Fig. 2.

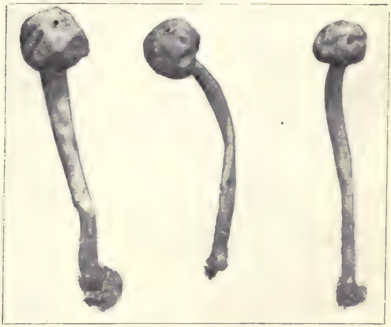

Fig. 3.

Fig. 2, enlarged. Fig. 3, specimens from W. W. Stockberger, Ohio.

TYLOSTOMA SIMULANS.

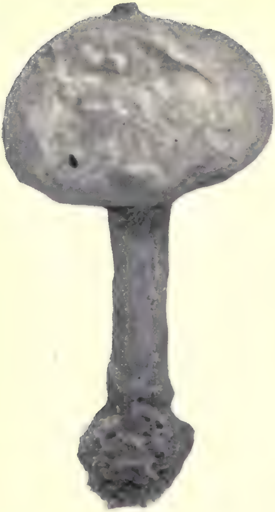

Fig. 4.

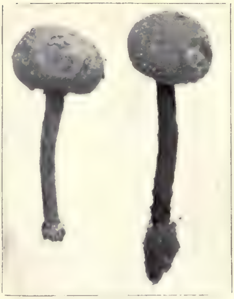

Fig. 5.

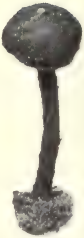

Fig. 6.

Fig. 4, a plant enlarged. Fig. 5, specimens from W. H. Long, Texas. Fig. 6, from T. H. McBride, Iowa.

TYLOSTOMA RUFUM.

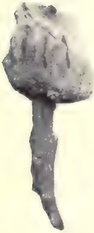

Fig. 7.

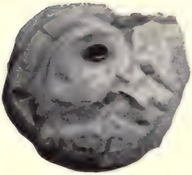

Fig. 8.

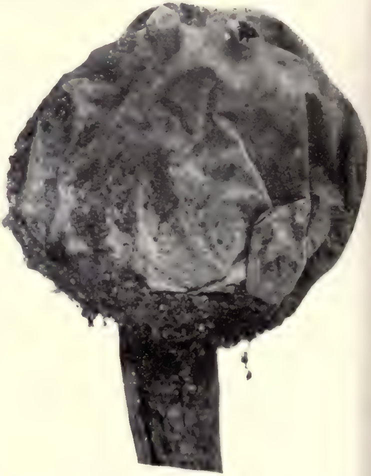

Fig. 9.

Figs. 7 and 8, type specimens in museum at Berlin. Fig. 9, plant enlarged, specimen from Professor D. McAlpine, Australia.

TYLOSTOMA PURPUSII.

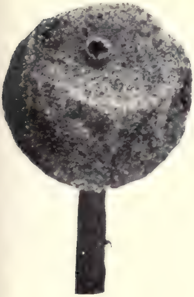

Fig. 1.

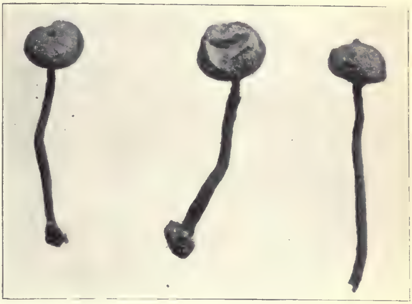

Fig. 2.

Fig. 1, enlarged. Fig. 2, specimens from Mrs. Delia Sams, Florida.

TYLOSTOMA FLORIDANUM.

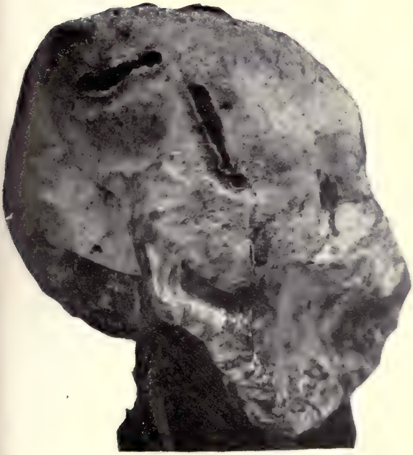

Fig. 3.

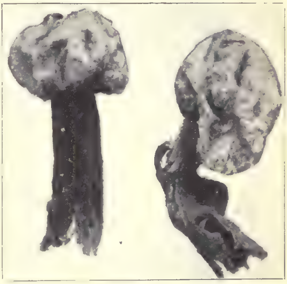

Fig. 4.

Fig. 3, enlarged. Fig. 4, specimens from Dr. X. Gillot, collected in Tunis.

TYLOSTOMA CAESPITOSUM.

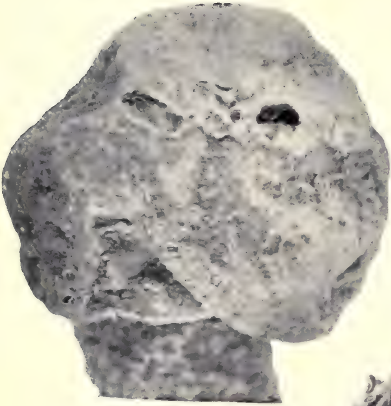

Fig. 5.

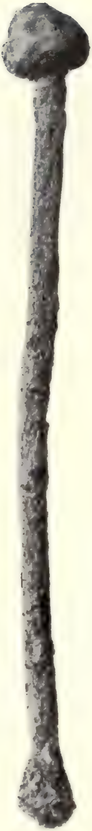

Fig. 9.

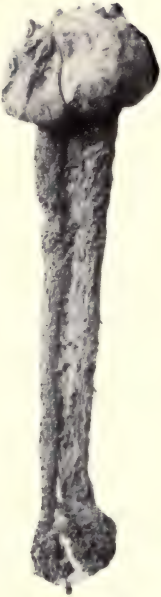

Fig. 8.

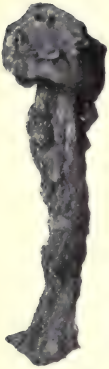

Fig. 6.

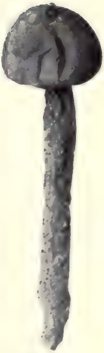

Fig. 7.

Fig. 5, enlarged. Figs. 6, 7, 8 and 9, all from E. B. Sterling, Denver, Colo.

TYLOSTOMA AMERICANUM.

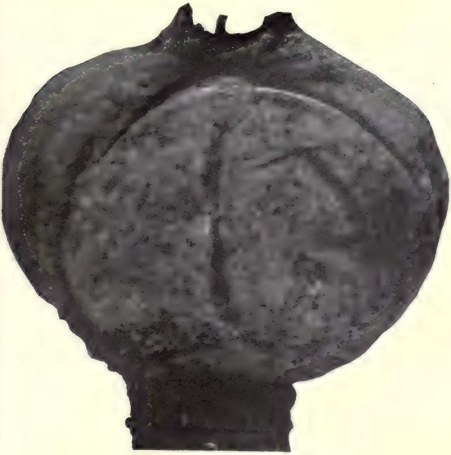

Fig. 1.

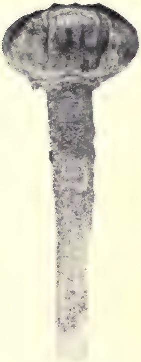

Fig. 2.

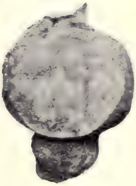

Fig. 3.

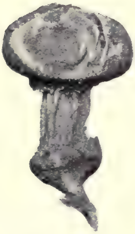

Fig. 4.

Fig. 5.

Fig. 1, enlarged. Figs. 2, 3, 4 and 5, specimens in museum at Berlin, collected in Africa by Schweinfurth.

TYLOSTOMA VOLVULATUM.

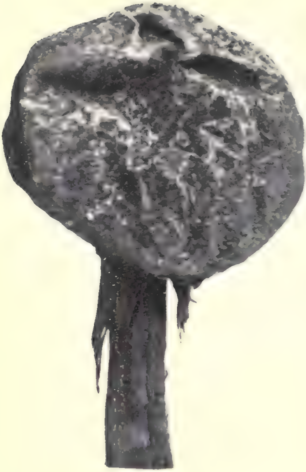

Fig. 6.

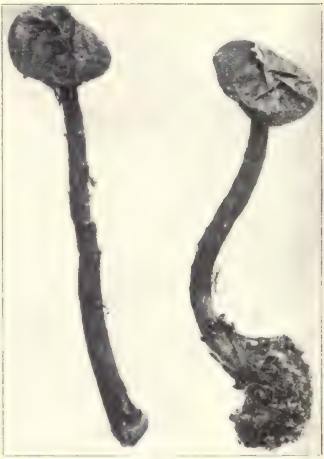

Fig. 7.

Fig. 6, enlarged. Fig. 7, specimens from Rev. J. Rick, Brazil.

TYLOSTOMA RICKII.

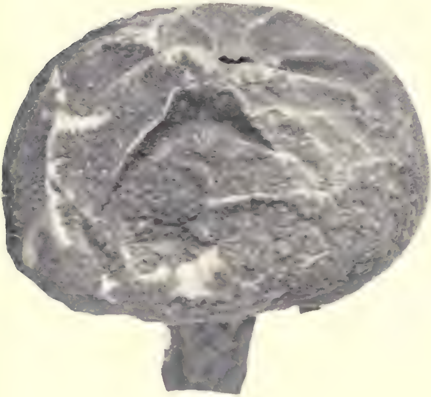

Fig. 8.

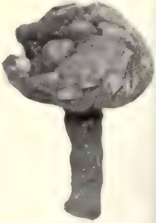

Fig. 9.

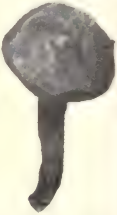

Fig. 10.

Fig. 8, enlarged. Figs. 9 and 10, specimens from Professor D. McAlpine, Australia.

TYLOSTOMA AUSTRALIANUM.

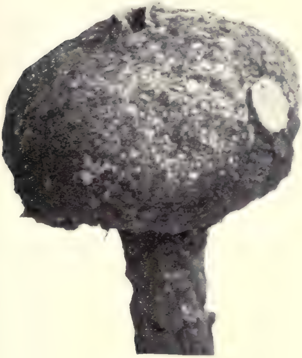

Fig. 1.

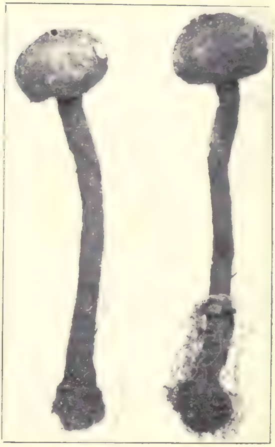

Fig. 2.

Fig. 1, enlarged. Fig. 2, specimens from F. M. Reader, Australia.

TYLOSTOMA READERII.

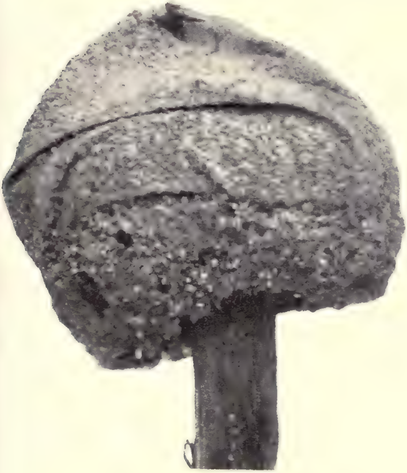

Fig. 3.

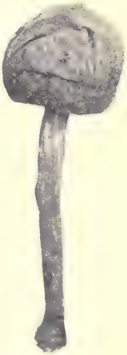

Fig. 4.

Fig. 3, enlarged. Fig. 4, specimen from F. M. Reader, Australia.

TYLOSTOMA EGRANULOSUM.

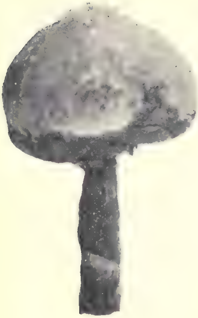

Fig. 5.

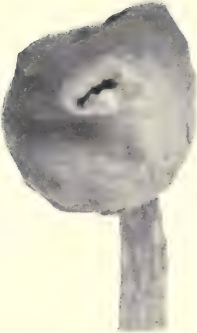

Fig. 6.

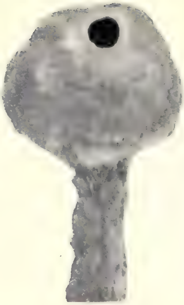

Fig. 7.

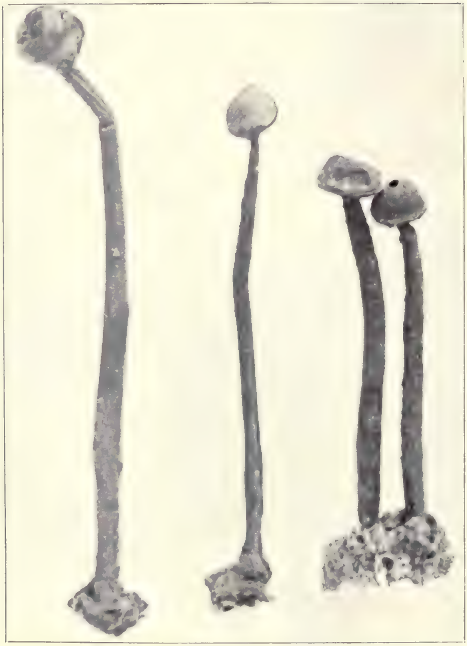

Fig. 8.

Figs. 5, 6 and 7, enlarged, showing the mouth at three periods of age. Fig. 8, specimens collected near Cincinnati by Walter H. Aiken.

TYLOSTOMA LLOYDII.

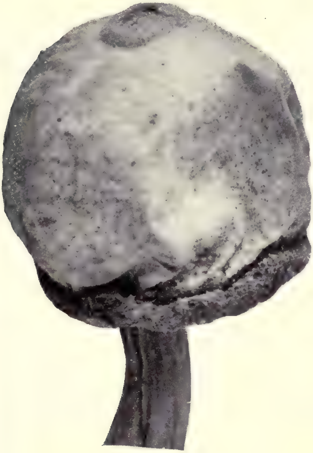

Fig. 1.

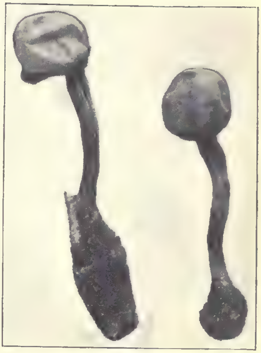

Fig. 2.

Fig. 1, enlarged. Fig. 2, specimens from Rev. J. M. Bates, Nebraska.

TYLOSTOMA POCULATUM.

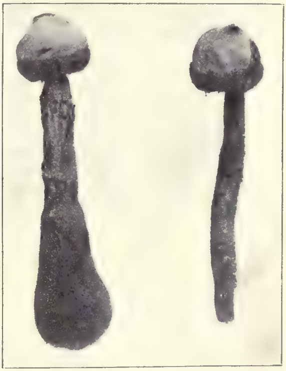

Fig. 3.

Fig. 3, specimens from C. V. Piper, Washington.

TYLOSTOMA TUBERCULATUM.

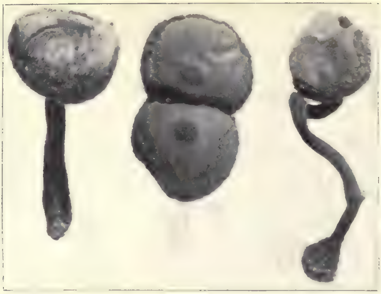

Fig. 4.

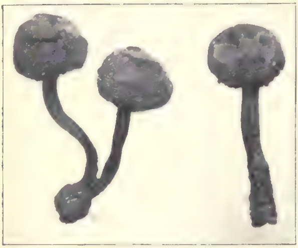

Fig. 5.

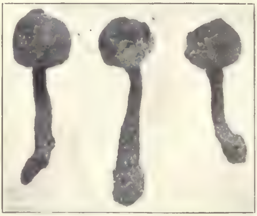

Fig. 6.

Fig. 4, specimens from Prof. D. McAlpine, Australia. Fig. 5, from Rev. J. M. Bates, Nebraska. Fig. 6, a small form from Theo. L. Mead, Florida.

TYLOSTOMA SUBFUSCUM.

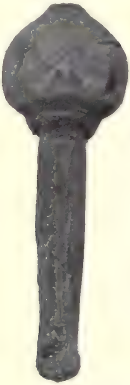

Fig. 7.

Type specimen in the Ellis collection, New York Botanical Garden.

TYLOSTOMA OBESUM.

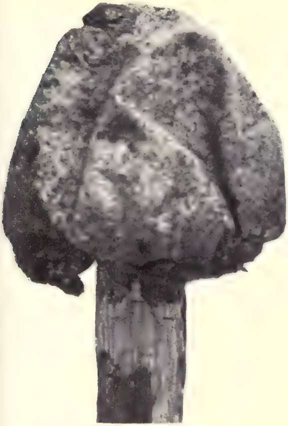

Fig. 1.

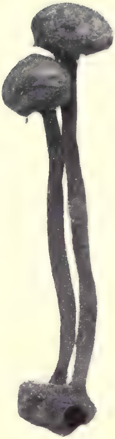

Fig. 2.

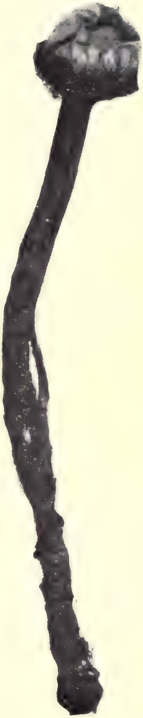

Fig. 3.

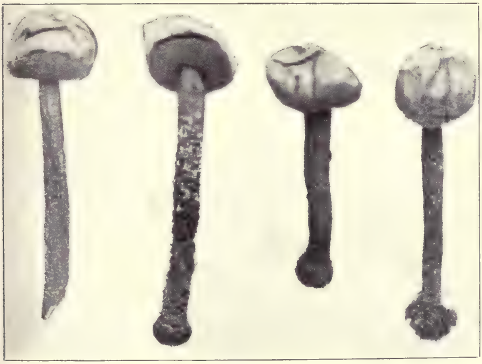

Fig. 4.

Fig. 1, enlarged. Fig. 2, a slender form from Captain Pyat Felix, France. Fig. 3, an obese form from E. Boudier, France. Fig. 4, the usual form, specimens from Rev. Bresadola, Tirol; Dr. Hollos, Hungary; N. Patouillard, France, and Professor Magnus, Germany.

TYLOSTOMA GRANULOSUM.

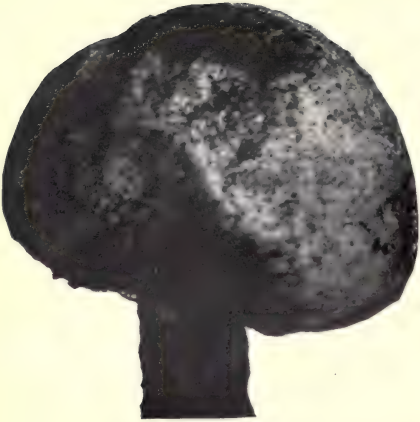

Fig. 5.

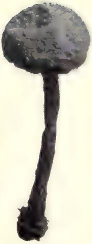

Fig. 6.

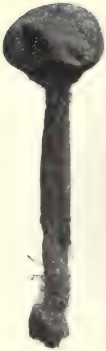

Fig. 7.

Fig. 5, enlarged. Figs. 6 and 7, specimens from J. Dearness, Canada.

TYLOSTOMA CAMPESTRE.

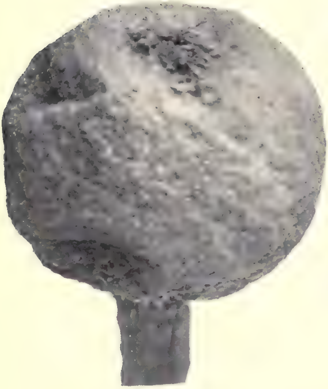

Fig. 8.

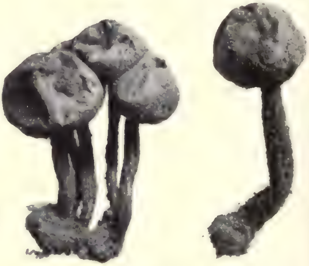

Fig. 9.

Fig. 8, enlarged. Fig. 9, specimens from F. S. Earle, Alabama.

TYLOSTOMA BERKELEYII.

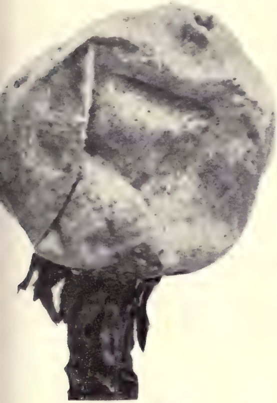

Fig. 1.

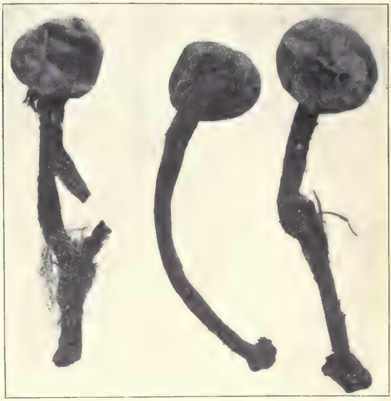

Fig. 2.

Fig. 1, enlarged. Fig. 2, specimens from Miss B. Stoneman, South Africa.

TYLOSTOMA CYCLOPHORUM.

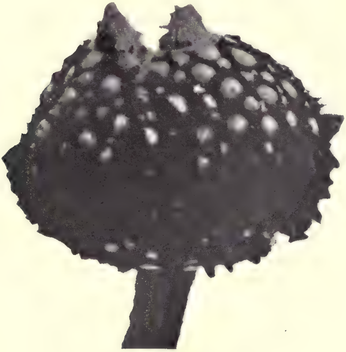

Fig. 3.

Fig. 3, enlarged. (See over.)

TYLOSTOMA EXASPERATUM.

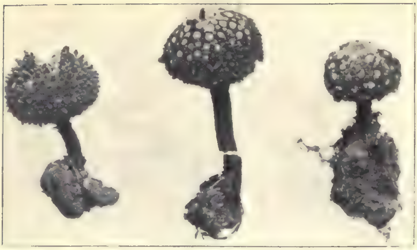

Fig. 4.

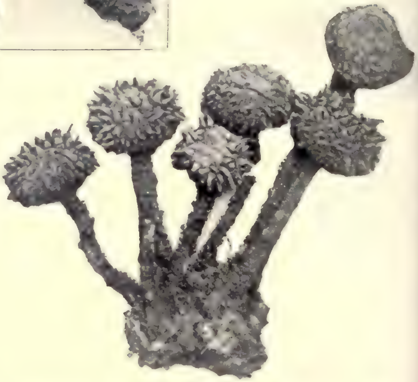

Fig. 5.

Fig. 4, specimens from Rev. J. Rick, Brazil. Fig. 5, specimens from India in Herbarium at Kew.

TYLOSTOMA EXASPERATUM.

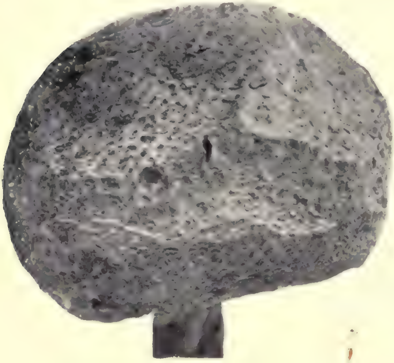

Fig. 6.

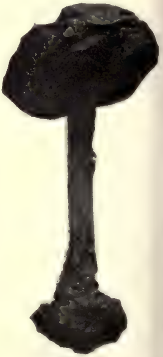

Fig. 7.

Fig. 6, enlarged. Fig. 7, type specimen in alcohol, museum at Paris.

TYLOSTOMA LEVEILLEANUM.

Reprinted 1925

THE
NIDULARIACEAE

OR

"BIRD'S-NEST FUNGI"

ILLUSTRATED
WITH TEN PLATES AND TWENTY FIGURES

By
C. G. LLOYD

CINCINNATI, OHIO, U. S. A.
DECEMBER, 1906.

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

L. R. TULASNE.

Who first made a thorough study of the Nidulariaceae, and wrote the first monograph on the subject, and whose careful, accurate work will always remain as the highest authority.

NIDULARIACEAE.

The Nidulariaceae are well known as the "Bird's-nest fungi," so called because the little cups filled with little "eggs" are likened to miniature bird-nests. In mycology they are classed as Gastromycetes, but to me they seem to have very little in common with other Gastromycetes. They are found all over the world, and there is probably no country that does not have several species.

We have been particularly interested in these little bird's-nest fungi for several years, and have persistently importuned our correspondents, especially those in the tropics, to send us specimens. That our appeals have not been in vain the two hundred and more collections, as acknowledged in detail in this pamphlet, are in evidence. We wish to thank each individual who has aided by sending specimens. The work on this pamphlet was done in the museum of cryptogamic botany at Paris, France. We had, however, previously made studies of the material at Kew, and most of the historic specimens in this family are preserved either at Paris or Kew.

DEFINITION OF TERMS.

PERIDIUM.—The cups are called peridia. In most genera they are cup or bell-shaped, the mouth covered when young with a thin membrane, known as the epiphragm. In one genus (Nidularia) the peridium is globose, and has no epiphragm. The peridium walls are tough and composed (usually) of three layers. The external layer is always more or less hairy or tomentose, and I have found that the general nature of the cups and of this external surface usually characterizes species. Cups vary much in the same species as to size and shape.

EPIPHRAGM.—The thin membrane, covering the mouth of the peridium when young, is called an epiphragm. It consists of two layers, the outer hairy or tomentose, of the same nature as the outer layer of the cup. In the genera Crucibulum and Nidula, these two layers persist until the epiphragm is broken. In Cyathus the outer, hairy layer is detersive, and early falls away, leaving the inner, thin, white layer stretched across the mouth of the cup like the head of a drum. When the peridium reaches its full growth, the epiphragm breaks away and disappears, exposing the peridioles or "eggs" of the cup. Numerous illustrations of cups having epiphragms will be found in our plates, particularly No. 104 (Crucibulum vulgare) and No. 106 (Cyathus striatus).

PERIDIOLES.—The little "eggs" that are found in the interior of the cups we call peridioles. Usually they are called sporangioles, but I like the term peridiole better. They are always lenticular in shape, usually one or two (rarely three) millimeters in diameter. The color of the peridioles is characteristic of the genera. Cyathus has black peridioles; Nidularia (with one anomalous exception) Nidula and Sphaerobolus have brown peridioles; Crucibulum has black peridioles, but covered with a thick, white tunica, so that they appear white. The peridioles contain the spores of the plant which are microscopic in size.[1]

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[1] Several centuries ago some of the old botanists thought that the peridioles were the seeds of the plants and wrote learned articles on the subject. Tulasne gives a full history of these ancient views, which were recently re-dished up in full by Miss White. I do not feel that the subject should take so much space for I think that for a hundred years no one, except perhaps some children, has thought that sporangioles are the seeds.

THE FUNICULUS.—In the genera Cyathus and Crucibulum the peridioles are attached to the cups by elastic cords called funiculi. When dry they are brittle, but when wet they are elastic and capable of long extension. It is easy to stretch them five or six inches, and when extended they appear like threads of cob-web. Our figure (1) shows a peridiole (enlarged) with the funiculus attached. The microscopic structure of the funiculus is very complex, and Tulasne has explained it at length. It is more simple in the genus Crucibulum than in Cyathus. The structure consists of hyaline filaments *which are nodular* at intervals. Our figure (2), taken from Tulasne, will illustrate the ordinary appearance of these threads under the microscope. Genera are based on the presence or absence of funiculi. Thus Cyathus[2] and Crucibulum have funiculi; Nidula, Nidularia and Sphaerobolus have none.

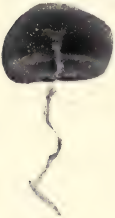

Fig. 1.

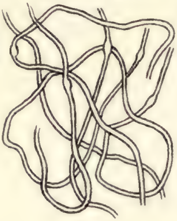

Fig. 2.

THE TUNICA.—Surrounding the peridioles of most species is a thin, white membrane, called the tunica. In most species the tunica is so thin that when dry it is seen with difficulty, but it swells and is more evident when the peridiole is soaked in water. Crucibulum vulgare is the only species with a relatively thick and evident tunica. In our cross section of a section of the peridiole of Crucibulum vulgare (Fig. 3 enlarged) the tunica is readily seen surrounding the (black) peridiole wall. In figure 4 (peridioles of Crucibulum vulgare, enlarged) a broken tunica is evident on one of the peridioles. In the genus Cyathus the tunica is often an uncertain factor, for it is so thin it is often difficult to decide whether it exists or not. Where it exists it is always more evident when the peridiole is soaked in water. In some species (notably the common Cyathus stercoreus) I am satisfied there is no tunica whatever. Cyathus striatus (the European form, *not* the American form) has the most evident tunica in the genus Cyathus.

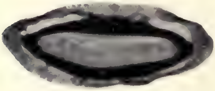

Fig. 3.

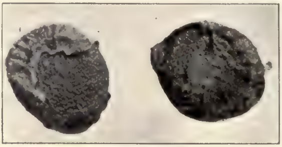

Fig. 4.

THE WALLS OF THE PERIDIOLES.—The outer wall of the peridiole is of a hard, horny nature, and must be soaked (about twelve hours) in water before it is practicable to section it. Two very different structures are found

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[2] We have rarely seen collections of Cyathus stercoreus where the upper peridioles in the cups *are not attached by funiculi*. We have considered it only as a kind of *lapsus* for in the same collection we find cups with all the peridioles attached and otherwise the plants have all the characters of the species. It was Miss White, in reality who first discovered that Cyathus stercoreus does not always have funiculi (Cfr. her article "Cyathia ? Sp.", but she was so unfamiliar with the character of the species that she was unable to correctly interpret her discovery. It is a feature of inexperience that anything out of the ordinary can only be explained by the theory of a "new species."

(in different species) which character we have used in arranging the species in groups. In one section (of which the common Cyathus stercoreus is a familiar example) the peridiole wall consists of two layers with *coarse, deeply colored* filaments intervening. If a peridiole is slightly soaked, these filaments seem to be placed between the layers, but after a prolonged soaking in water, four or five days, the outer layer swells, and a section then shows that the filaments are imbedded in the tissue of the outer layer.[3] Our figure 5 (an enlarged section of a peridiole of Cyathus stercoreus) plainly shows this outer layer partially detached. Tulasne applied the term "tunica" to this layer in the species when he noted it, but to us this is a misapplication of the term, as the nature is very different from a tunica, and we feel the term should only be applied in the sense we have indicated under the previous heading. Usually these colored filaments are simple, unbranched or slightly branched and form (apparently) a kind of woven tissue. In Nidula emodensis they are peculiar, having many short, sharp-pointed branches, a structure we have noted in no other species. I think the structure of the walls of the peridioles of all species of Nidulariaceae are of the same general nature, but many species do not have these *coarse, deeply colored fibrils.* They are, on the other hand, much thinner, pale-colored or sub-hyaline, so that the sections appear quite different, and the character can be readily used in classification.

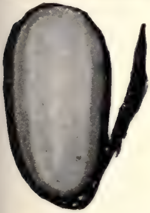

Fig. 5.

THE INNER STRUCTURE OF THE PERIDIOLE.—A section of the peridiole of any species, shows the interior filled with a white or sub-transparent, hard, horny substance. This is always in two layers, clearly differentiated by a distinct line as shown in figure 6 (a section of the peridiole of Cyathus pallidus, strongly enlarged). The tissue under the microscope is composed of irregular, angular granules, somewhat elongated and very irregular in shape. I do not feel that the word "filament" should be applied to this tissue, for it has led to a very erroneous statement of facts.[4] The outer layer of tissue is mostly (if not entirely) sterile. The spores are imbedded in the tissue of the inner layer.

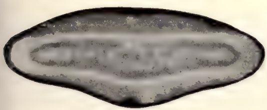

Fig. 6.

SPORES.—The spores of all Nidulariaceae are *hyaline.* Usually elliptical, they are sometimes subglobose, and vary much in general size in different species. Thus, there are species with large spores (30-50 mic), species with small spores (4-8 mic.) and species with medium spores (12-25 mic). The general size and shape of spores characterize species, but the particular size is of no value whatever, and much latitude must be given to all spore measurements. Spores not only vary in size in the same collection, but in the same peridiole, and I have noted two spores side by side differing more than ten mic. in length. One finds the spores very abundant in the peridioles of the small-spored species. On the contrary, they are usually scanty (or often wanting) in most of the large-spored species. If, in examining for spores, one has trouble in finding them, it is safe to assume that the plant belongs to a large-spored species. The spores of Nidulariaceae are said to be borne on basidia, but in the mature specimens no evidence of the attachment can be noted such as is usually very noticeable on basidia-spores. They have more the general appearance of asci-spores.[5]

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[3] Reminding me of the fibres one notes in the pith of the stem of the corn stalk.

[4] When De Toni compiled the Nidulariaceæ in the seventh volume of Saccardo he distinguished the genus Cyathus from Crucibulum, the former having "sporæ filamentis immixtæ," the latter "sporæ nullis filamentis immixtæ." Miss White has copied apparently the same error in her paper. It originated, I think, in a misreading of what Tulasne states on the subject, for while this inference might be drawn from Tulasne's work, I do not believe he ever intended to convey such an idea. The internal structure of the peridioles of all genera of Nidulariaceæ is practically the same, and affords no generic differences and none of them have any threads mixed with the spores.

HISTORY.—The early history of Nidulariaceae, as of all fungi, is vague, owing to the multiplication of names by the early mycologists. There are only three common species in Europe, but Tulasne has shown that they were illustrated and described under more than twenty different specific names, and double that number of different combinations. But one real *original* monograph of the subject was ever written, viz: by Tulasne in 1844. When Tulasne took hold of the subject all was confusion. He made a careful and thorough study of the structure, established the genera, and selected the best names for the species as they appeared to him. Since this monograph appeared, mycologists in general have shown their appreciation of his work by using his names. We have done so in every instance without *any juggling whatever.*

When Tulasne wrote his monograph, excepting the three common species of Europe, he had but scanty material, only seventeen collections from foreign lands, which he referred to thirteen species. We have studied all of this material (and many times as much more), and we think that Tulasne's species are practically all "good." Since Tulasne's day, sixty years ago, very little additional, systematic work has been done. The usual number of "new species" has been added, some very good, and some, in our opinion, very bad. Miss Violet S. White, a young lady of New York, has recently published (Bull. of the Torrey Club, May, 1902), an account of the American species. It was a good paper *(barring the name juggling[6])* and brought out a number of new facts, the most important being the genus Nidula.

GEOGRAPHICAL DISTRIBUTION.—The species of Nidulariaceae of the temperate world are relatively few, and there are but three *common* species in Europe, viz: Cyathus striatus, Cyathus vernicosus and Crucibulum vulgare. In the United States, in addition to these three, we have another *common* species, Cyathus stercoreus, which is *rare* in Europe. In Australia, Cyathus vernicosus, Cyathus stercoreus and Crucibulum vulgare are common, but Cyathus striatus (as far as I know) appears to be wanting. In addition to these common species there are, to my knowledge, only five rare species in Europe and America, viz: Nidularia pisiformis, Nidularia Heribaudii, Nidula candida, Nidula microsperma and Cyathus pygmaeus. We do not include in the above summary (the anomalous genus) Sphaerobolus stellatus, which is fairly common in Europe and America, and probably also in Australia. The species of the remainder of the world are relatively scantily known. In the tropics the species appear more numerous, and all different from the temperate region species. From the relatively few collections that are known more species probably have been made than will be maintained when the plants are well known. It is the experience, I think, of every one that the more material he has the fewer "species" he finds.

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[5] I would not have it thought that I question the accuracy of Tulasne's statements on the spores of the Nidulariaceæ being basidia-spores, for I am not inclined to question Tulasne on subjects concerning which I know nothing. I would only state that they do not appear the same as ordinary basidia-spores.

[6] As a striking example of how easy it is to juggle botanical names, Miss White takes the synonyms in Tulasne's monograph, and with a date dictionary shuffles up a "new combination" for *every known species of Nidulariaceæ* she considers. Tulasne, who did *all the work*, does not have a single name left. If this juggling was not done with Tulasne's synonyms it could have been in fifteen minutes' time, but it seems to have been so done for questions of "priority" not explained by Tulasne are not considered in her paper. I do not question but that Miss White acted conscientiously and to the best of the limited light under which she worked. She was young, inexperienced, under bad advisers who ought to know better, and she could not realize at what a low standard such work is generally held in the mycological world. Since her paper appeared two publications considering the Nidulariaceæ have been issued. Saccardo takes recognition of her new genus Nidula, which is really meritorious, but completely ignores her other names. Dr. Hollós, who is quite expert himself when it comes to concocting "new combinations" for the purpose of adding "Hollós" to them, sees no merit in such work when done by another. *He turns down every one* of Miss White's juggled names.

THE GENERA OF THE NIDULARIACEÆ.

There are only five known genera of Nidulariaceae, and excepting the genus Cyathus, each embraces a very few species. The genera are distinguished by the following characters:

Peridium cup shaped, with walls of three layers. Peridioles attached by funiculi. Tunica thin or wanting..................Cyathus.
Peridium cup shaped, of a single layer. Peridioles with funiculi. Tunica thick[7]......................................Crucibulum.
Peridium cup shaped, of one (or two) layers. Peridioles without funiculi ....Nidula.
Peridium globose, friable, of a single layer. Peridioles without funiculi ....Nidularia.
All the above have numerous peridioles, while the following genus has a single peridiole in each cup......................Sphaerobolus.

THE GENUS NIDULARIA.

Peridium globose, of a single layer, without an epiphragm, dehiscing by the regular breaking away of the walls or sometimes by a circumscissile opening. Peridioles numerous, filling the cavity, and imbedded in a mucilaginous substance (when moist). Not attached by funiculi.

The genus Nidularia (in my opinion) embraces one rare, but widely distributed species, Nidularia pisiformis, three other species, each known from a single collection, N. australis (Chile), N. Duriaeana (Mauritius) and N. fusispora (Australia), also one anomalous species, N. Heribaudii (France). All are very different from the other Niduariaceae in *not having cup-shaped peridia.* The peridia are globose, with brittle, fragile walls, which often break away entirely, leaving a pile of naked peridioles. The peridioles of all (excepting Heribaudii) are brown.

NIDULARIA PISIFORMIS (Plate 102).—Peridium globose, filled with small *brown* peridioles. Walls of the peridium of a single layer, breaking irregularly or (sometimes, I think) in a circumscissile manner. Sometimes the peridium breaks away entirely, leaving a pile of naked peridioles. Surface of the peridium, particularly when young (see Plate 102, Fig. 6), cinnamon brown, flocculent, pulverulent[8], becoming lighter color and smoother when old. Usually the peridium is tubercular from pressure on the peridioles. Peridioles small, 1 to

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[7] The distinction between Cyathus and Crucibulum is not one marked difference that can be used as a key character, but rather the sum of a number of slight differences, which, taken together, make a good genus. Thus, they do not have exactly the same peridia, epiphragms, tunicae, or funiculi.

[8] The name of the American plant Nidularia pulvinata means "cushion shape," and does not refer to the pulverulent surface as I have always (through a confusion of the two words) supposed.

1½ mm., *brown,* imbedded (when moist) in a mucilaginous substance, and have no funiculi. When dry they are rugulose, but when moist are smooth. Spores broadly elliptical, 5-6 x 6-8, sometimes relatively a little broader, 6-7 x 8.

HISTORY.—This species seems to be widely distributed, but rare. We have it from Europe, United States and Brazil. It grows on rotten wood. It appears to me that whenever one of the old botanists about the beginning of the last century found this rare plant, he gave a picture of it and called it something new. We have looked up all these old pictures,[9] and there is nothing to indicate they are not the same plant.[10] We have neither received from our correspondents in America or Europe, nor have we seen in any of the museums at Paris or London similar specimens of the genus Nidularia that we can distinguish as more than one species. We feel then there is but one widely spread species of this genus, and that it occurs very rarely in Europe, United States, Brazil, and probably other countries.

SYNONYMS.—If the above position proves to be true, and all the evidence we have points to it, the following names will form its synonymy. We have studied authentic specimens of those followed with a star, or they are based on figures we have seen, and there is little question as to them in our mind. Cyathus farcta,* Nidularia farcta,* Nidularia radicata, Nidularia farcta var. radicata, Nidularia confluens,* Cyathus corrugatus, Nidularia corrugata, Cyathus globosus,* Nidularia globosa,* Nidularia denudata, Cyathus denudatus, Nidularia pulvinata,* Cyathus pulvinatus,* Nidularia Berkeleyi,* Nidularia pisiformis var Broomei.* Miss White states that Nidularia Alabamensis is a synonym for Nidularia pulvinata, and the "description" certainly would so indicate. "Granularia pulvinata" is a juggled name.[11]

RÉSUMÉ.—While we do not assert that all the foregoing are demonstrated to be the same plant, we are unable to learn what real differences exist between them, if any, and it is our opinion that they will all prove to be the same species. In all the specimens we have seen we have noted only the following differences, but whether they are specific or merely due to conditions, we are not prepared to state. Any one who finds these rare plants will perform a real service if they will carefully note the following points:

First, Color and Surface. Two forms are found in our specimens, smooth, whitish plants and pulverulent, brownish specimens. The latter, which is the condition usually found in my specimens from America, is no more evident in the American form than it is in many collections of Europe. I have thought that it may be the natural character of all, and that the smooth, pale collections may be due to age or wet weather conditions.

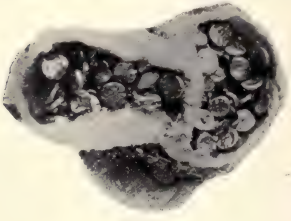
Fig. 7.

Second, Dehiscence. I note two types of dehiscence. Most plants we have seen and most descriptions and plates seem to show that the peridia break irregularly, falling away and leaving sometimes a pile of naked peridioles. Specimens that we have from Dr. Herbst (Fig. 7, enlarged four times) clearly show a circumscissile dehiscence. Sometimes we note indications of both these types in the same collection, but we would be glad to learn, from those who have an opportunity to observe the plant growing, *what are its natural methods of dehiscence.* No final conclusions can be reached as to whether one or two species are involved until these questions are settled. As to spores and peridioles, all are practically the same.

Notes 9, 10, 11, see next page.

SPECIMENS IN OUR COLLECTION.

Germany, Otto Jaap.
Denmark, Rev. J. Lind.
Canada, A. J. Hill.
United States, Pennsylvania, Dr. Wm. Herbst; *Minnesota,* Dr. J. E. Crewe; *Louisiana,* Rev. A. B. Langlois.
Brazil, Rev. J. Rick.

NIDULARIA AUSTRALIS (Fig. 8, enlarged four times).—Peridium cinnamon brown, subpulverulent, subglobose, dehiscing[12] in a circumscissile manner. Peridioles small, about 1 mm., brown, rugulose when dry. Spores 10-11 x 4½ (Tulasne's measurement).

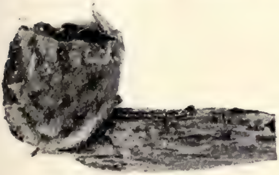
Fig. 8.

But one collection of this species is known, made in Chile by Gay, and preserved in Tulasne's herbarium. It grows on rotten wood, and in many of its features strongly reminds us of the previous species. The spores, according to Tulasne's measurements, are relatively longer and the dehiscence (of the only specimen that shows it) is more regularly circumscissile.

NIDULARIA DURIAEANA (Fig. 9, enlarged 4 times).—Peridium globose, brown, friable, scarcely exceeding 1 mm. in diameter. Peridioles small, brown, about ⅓ mm. Spores 6½-7 x 4½-5 (Tulasne's measurement).

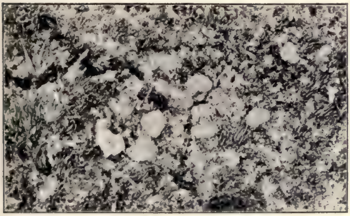
Fig. 9.

This unique little species is only known from a single collection, made by Durieu in Mauritius and now preserved in Montagne's herbarium. It is characterized by its very small size, the largest peridia measuring less than 1½ mm. in diameter. It grew on the naked ground in a little moss. From Tulasne's figure it would appear to grow on a piece of wood, but that is an error.

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[9] Viz: Roth. Catal. Bot. T. 7, f. 2; Ehrb. Sylv. f. 8; Roth. Ust. Ann. Bot. T. 1, f. 1.

[10] Excepting Holmsk. Beata Rur. T. 4, f. 2, which we think is a Nidula, not a Nidularia.

[11] Neither Roth who proposed the name Granularia, nor Miss White who juggled Tulasne' genus Nidularia under Roth's name seem to have had a very clear generic idea of Tulasne's genus, Both of them refer here Micheli's figure T. 102, f. 4, which clearly shows an epiphragm, and Micheli states the peridioles have funiculi and indicates them in his figure. The genus Nidularia has neither an epiphragm nor a funiculus.

[12] The only specimen that clearly shows this character.

NIDULARIA FUSISPORA.—The only specimen of the genus Nidularia that ever reached Europe from Australasia was collected by Rodway in Tasmania, and is now preserved at Kew. It is only a little fragment of naked peridioles, but they present characters different from those of the European species. In size they are only about half as large, barely measuring ½ mm. The spores present the most marked difference, being narrower than those of other species. The largest of them, according to my measurements, are 5 x 12 mic.

NIDULARIA HERIBAUDII (Figs. 10 and 11).—Peridium subglobose. light color. friable. containing a *few large, black* peridioles.

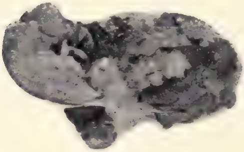

Fig. 10.

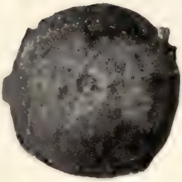

Fig. 11.

Peridioles varying in size, the largest 3 mm. in diameter, black, smooth. Tunica thin. Spores broadly ovate, 6 x 8.

This species of Nidularia differs entirely from all others in the large, black peridioles that are more of the nature of the peridioles of Cyathus, excepting that they do not have funiculi. The peridioles seem closely packed in the cup and are irregular in shape and size. The peridiole that we show enlarged (Fig. 11) appears to have a scar as though it had been attached by a funiculus, but we have carefully examined all the peridioles of the specimen, and are assured of the complete absence of funiculi. The type specimen (Fig. 10, enlarged four times) is very scanty and was collected in the central part of France on pine branches. It is now in the museum at Paris. We think that Nidularia rudis, which was described from scanty material from California (under the name Granularia rudis) will prove to be the same plant, and it is an earlier name. We have seen no specimens, but should we examine them and find them the same as those at Paris, will adopt the name (specific, not the juggled, generic name). Our figure (10) is the type specimen, all that exists at Paris (enlarged 4 diameters). Fig. 11, a peridiole enlarged 10 diameters, but few are as regular as this one.

THE GENUS NIDULA.

Peridium cup-shaped, opening by a thin epiphragm. The walls of the peridium consist of two layers, the inner thin, which is continuous with the layer that forms the epiphragm. In young specimens the outer (thick) layer is readily peeled away from the inner (thin) layer, but in old cups it is difficult to differentiate them. Peridioles free, imbedded when moist in a mucilaginous substance and not attached by funiculi. The genus Nidula is an excellent genus, recently proposed by Miss White. It has the cup and epiphragm of a Crucibulum and the peridioles of a Nidularia. The genus was overlooked by both Berkeley and Peck, who had previously worked with it. Tulasne never saw a specimen in his life.[12] The genus Nidula seems to be of a northern range. It reaches me abundantly from one correspondent (Albert J. Hill) New Westminister, Canada, and from Northwestern United States. I have it scantily from Japan and Australia, and Berkeley had an ample collection from the Himalayas, India. It does not seem to occur in warm countries, or over the greater portion of the United States or Europe.[13]

NIDULA CANDIDA (Plate 103).—Peridium cup-shaped, with a spreading mouth, 1 to 1½ cm. high. Outer surface shaggy-tomentose, the tomentum tufted. Peridioles 1½-2 mm., broad, light brown, smooth (not wrinkled), with a thin tunica. Spores 4-6 x 8-10, elliptical, smooth, with granular contents.

This plant reaches me only from Albert J. Hill, New Westminster, B. C., Canada. It grows in damp places in the woods, usually on rotten sticks, twigs.

SPECIMENS IN OUR COLLECTION.

Canada, A. J. Hill (3 collections).

NIDULA MICROCARPA (Plate 103).—Peridium cup-shaped, with a straight or slightly spreading mouth. About ½ cm. high. Outer surface appressed-tomentose. Peridioles ½-1 mm. broad, reddish brown, rugulose when dry. Spores 5-6 x 7-8, elliptical, smooth.

This plant is very close to the preceding and grows in similar localities. I was at first disposed to think it was only a variety. The peridia are smaller and smoother, peridioles smaller and darker color, and the spores are relatively broader. The cups of young specimens have a general resemblance to those of Crucibulum vulgare, but the plants can be easily distinguished as this has *brown* peridioles, and Crucibulum white peridioles.

SPECIMENS IN OUR COLLECTION.

Canada, Albert J. Hill (2 collections); *Washington*, T. C. Frye, C. V. Piper (2 collections).

A FORM FROM AUSTRALIA.—I have received from F. M. Reader, collected in the County of Follett, a rather scanty collection, which for the present I refer to Nidula microcarpa. It has the same cups, but the peridioles are smaller (about ½ mm.), and the spores are slightly longer, 5-6 x 8-10. It is the only collection of the genus Nidula known from Australia. We have also a single cup of a Nidula from Japan, but the material is so scanty we would not wish to say anything, other than to record the *genus* in Japan.

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[12] It might appear that the section Scutula " Peridium regulariter apice dehiscens " of Tulasne's genus Nidularia is the same as Nidula. The only specimen of this section Tulasne saw was Nidularia australis, which is a true Nidularia as to its cup, and has no epiphragm.

[13] I have never seen a specimen from Europe, but I am satisfied the old figure of Holmskjold (Beata Rur. T. 4, f. 2) represents this genus.

Specimens in Our Collection.

Australia, F. M. Reader.
Japan, T. Yoshinaga.

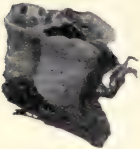

Fig. 12.

A LARGE FORM FROM WASHINGTON (Fig. 12). We have from T. C. Frye what we consider a large form of Nidula microspora, although the cups are more than twice as large as the usual form, and some spores are considerably larger, measuring 6 x 12. We hardly feel that the form is worthy of a name even as a form, as the size of the cups is a much varying factor in most species of Nidulariaceae.

Specimens in Our Collection.

Washington, T. C. Frye.

NIDULA EMODENSIS (Plate 103).—Peridium cup-shaped, with a somewhat spreading mouth, white, shaggy-tomentose. Peridioles about 1 mm. in diameter, reddish brown, wrinkled when dry. Outer peridiole wall thick, of rigid, woven, colored fibrils, which have many short, spiny branches. (We have not met this structure in any other species of Nidulariaceae.) Spores ovate, 4 x 8.

There is an abundant collection of this species from Sikkim, in the Himalayas, India, in Hooker's herbarium at Kew. It has a close, general resemblance to Nidula candida of Canada, but differs from all species known to me, in the peculiar, spiny, branched fibrils of the outer peridiole wall. It was described as Cyathus emodensis, and while the discovery of the "new species" was of interest, it would have been of more general interest had the author discovered that he had a "new genus," very different in the nature of the peridioles from the genus Cyathus in which it was placed.

NIDULA GRANULIFERA.—While we have never seen a specimen of the genus Nidula from Europe, we feel confident that the plant illustrated in Holmskjold's Beata Rur. (T. 4, f. 2), about a hundred years ago, was drawn for a Nidula. As to species, of course, the plate tells nothing, and it will probably prove to be one of the species recently described from America.

THE GENUS CRUCIBULUM.

Peridium cup-shaped, composed of a single, thick, uniform layer, lined on the inner side with a very thin, often silvery lining, which is said to be the "remnant of the mucilaginous matter that fills the cup," but appears to me to be a distinct, but very thin membrane. When young the mouth is covered with an epiphragm, yellow tomentose on the surface. Peridioles numerous, filling the cup, attached to the cup by a simple funiculus, which can be extended at length when moist. Tunica, a loosely woven, thick,[14] easily ruptured membrane. Peridioles (deprived of tunica) black. The walls of the peridiole are 90-100 mm. thick, closely woven, black externally, but the inner portion subtransparent. The interior of the peridiole is hyaline, about 200 mm. thick at the broadest part, consisting of innumerable elliptical, hyaline spores, imbedded in irregularly shaped, hyaline tissue.

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[14] Compared to the tunica of all other Nidulariaceæ.

The genus Crucibulum consists of a single known species,[15] very common in Europe, America and Australia, and reported from North Africa, Mauritius and other countries. I have never seen specimens from the tropics proper.

CRUCIBULUM VULGARE (Plate 104).—Peridium bell-shaped, usually about 8 mm. high and broad at the mouth. When young with a yellowish velvety tomentum externally, but soon becoming smooth and brown, when very old often bleaching white. Even without and within. The mouth covered when young with an epiphragm, which is a continuation of the walls of the peridium. It is covered with a yellowish tomentum on the upper surface, consisting under the microscope of peculiar hairs with numerous short, sharp branches. (Fig. 13, taken from Tulasne.) The normal peridioles measure about 2 mm. in diameter. They vary in size, and peridioles measuring 1¼ to 2¼ mm. are sometimes found in the same cup. The tunica is light colored, usually white in old specimens,[16] and consists of a loosely woven membrane which frequently ruptures. The peridiole (deprived of this tunica) is black. The funiculus is a simple, elastic, thin cord, capable of long extension when wet. It is attached to a little nipple-like protuberance on the peridiole.

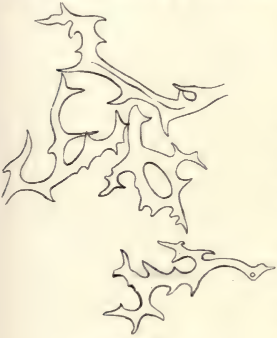

Fig. 13.

The spores are very numerous, and fill the interior of the peridiole, imbedded in an irregular, angular tissue. They are hyaline, elliptical, and measure 4-6 x 8-10 mic. Crucibulum vulgare is probably the most common and widely spread bird's nest fungus that grows. It occurs over Europe, America and Australia, and probably other countries. It grows on twigs, chips, old mats and debris of various kinds, and sometimes on dry manure cakes. It rarely (if ever) occurs growing on the earth or on large logs. Very often the cups grow inside of old cups of the same species, as shown in figs. 2 and 4, plate 104, and this is the only "bird's nest fungus" I have ever noticed with this habit. A very small form (Plate 104, fig. 3) is often met, particularly in Australia, frequently on dry cakes of manure, which has cups 3-4 mm. broad and proportionately small peridioles.

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[15] Two other species have been "described" but they are both errors. Miss White has examined Crucibulum juglandicolum and states its synonymy with Crucibulum vulgare. I can state the same as to Crucibulum simile. The latter was based on supposedly smaller spores, but my measurements show them to be exactly the same as the normal plant.

[16] And by this character Crucibulum vulgare can be readily recognized as it is the only "bird's nest-fungi" known with white "eggs."

SYNONYMS.—Tulasne, who straightened out the subject, gives the following synonyms: Cyathus crucibuliformis, Nidularia Crucibulum, Nidularia leucosperma, Cyathus ericetorum, Cyathus cylindricus, Nidularia levis, Cyathus Crucibulum, Peziza crucibuliformis, Peziza lentifera, Peziza Pyxis, Peziza levis.

These were mostly based on the vagaries of the old botanists who seemed to think every time they considered the plant they had to give it a new name. In addition (see Note 15, page 13), Nidularia juglandicola, Crucibulum juglandicolum, Crucibulum simile, Cyathus fimetarius, Cyathus fimicola, Cyathus pezizoides and Cyathus pusio are all synonyms. The latter three from Australia are all the same plant, small specimens of Crucibulum vulgare. And then, as if this poor, little plant did not have enough burdens to bear in the way of useless names, Miss White recently added another to the load, Crucibulum crucibuliforme, pure name-jugglery.

SPECIMENS IN OUR COLLECTION.

Canada, J. Macoun.

Minnesota, Dr. Mary S. Whetstone, Dr. J. E. Crewe; *Wisconsin,* Chas. E. Brown; *New Hampshire,* C. E. Montgomery; *Massachusetts,* G. E. Morris, Clara E. Cummings, R. B. Mackintosh; *Pennsylvania,* Dr. Wm. Herbst, Charles McIlvaine, Mrs. Dallas; *Washington, D. C.,* A. Hrdlicha; *Illinois,* H. C. Beardslee; *Ohio,* Walter H. Aiken, Thomas Bell, C. G. Lloyd; *Kentucky,* C. G. Lloyd; *Maryland,* W. T. Lakin; Georgia, H. N. Starnes; *North Carolina,* Miss Mary Fitzgerald; *Missouri,* P. Spaulding; *Colorado,* Ernest Knaebel; *California,* Edw. P. Ely.

Ireland, Greenwood Pim; *Scotland,* Mary L. Miles; *England,* C. Crossland, Mrs. A. Montague, E. W. Swanton.

France, N. Patouillard, G. Renaudet, Capt. Pyat Felix, L. Rolland, Rev. H. Bourdot, Dr. X. Gillot.

Spain, T. de Aranzadi.

Belgium, Madame Rousseau.

Germany, Otto Jaap, Wm. Krüger, C. Engelke, Prof. Plöttner, Dr. O. Pazschke, Madame Schultze Wege.

Bohemia, F. Bubak, A. Weidmann.

Switzerland, Denis Cruchet.

Denmark, J. Lind, Rev. A. Breitung.

Sweden, L. Romell, L. Neger, C. G. Lloyd.

Russia, A. Jaczewski.

Australia, Melbourne, F. Reader.

(NOTE.—There are at Kew several collections of this species from Australia.)

THE GENUS CYATHUS.

Peridium cup-shaped, composed of three distinct layers. When young the mouth is covered with a thin, white, smooth epiphragm.[18] Peridioles, usually filling only about one-half the cup, always black, attached to the cup by funiculi. Tunica usually very thin, on some species none, white, but so thin it hardly masks the black color of the peridiole wall. Spores hyaline, varying much in size (from 6 to 40 mic.) in the different species, imbedded in irregular, angular, hyaline tissue. The genus Cyathus includes more species than all the other genera of Nidulariaceae combined. But two common species occur in Europe (Cyathus striatus and Cyathus vernicosus) and in America in addition to these two, we have another common species (Cyathus stercoreus). Most of the species are of warm countries, and very different from the above three. The genus Cyathus is readily divided into two sections:[19]

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[18] The epiphragm of Cyathus, in some species at least, when very young is covered with loose hairs, which early fall away leaving the usual epiphragm a very thin, white membrane, stretched tensely over the mouth of the cup like the head of a drum.

EUCYATHUS.—Cups striate inside.

OLLA.—Cups even and smooth inside.

The greatest difference that is found in the species of Cyathus is the size of the spores. Some species have very large spores, others very small spores, and most of the species have medium-sized spores. We would divide the genus into five sections according to the general nature of the cups and peridioles.

Section 1.—Eucyathus—Cups striate. Tunica none or very thin. Outer peridiole wall thick, of coarse, colored fibrils.

Section 2.—Eucyathus—Cups striate. Tunica none, or a thin membrane. Outer peridiole wall not strongly different from the inner.

Section 3.—Olla—Cups even, with strigose, shaggy hairs. Tunica none. Outer peridiole wall with coarse-colored fibrils.

Section 4.—Olla—Cups even, with hirsute, hispid, coarse hairs. Tunica a thin, soft membrane. Outer peridiole wall not strongly different from the inner.

Section 5.—Olla—Cups even, rigid, comparatively smooth, with fine subappressed hairs. Outer peridiole wall not strongly different from the inner.

SECTION 1.

CYATHUS POEPPIGII (Plate 105).—Cups conic, bell-shaped, 8-10 x 5-6 mm., dark brown, strigose, hirsute, striate within and *strongly striate externally*. Peridioles black, 1½-2 mm. in diameter, *with a thick*, fibrous, *outer peridiole wall*. Tunica none. Spores very large, varying much in size, even in the same peridiole,[20] but always large. Usually 24-28 x 30-42 mic. We have noted them as large as 32 x 50 mic.

This is a frequent species in warm countries, and probably occurs throughout the warm regions of the earth. We have it from four widely distant localities, and have seen many others at Paris and London. It seems to replace Cyathus striatus of temperate regions, and to have very much the same habits. In Samoa we found it growing densely caespitose on a piece of rotten cloth.

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[19] We include in "Eucyathus" only those species that are distinctly, strongly striate. Some of the species placed in "Olla" when old have faint striae, but we feel they are better placed in "Olla" than "Eucyathus."

[20] We give the measurements of six spores, all averaging small, from the same peridiole of a Samoan specimen: 16 x 32; 12 x 28; 12 x 20; 12 x 16: 12 x 34; 14 x 40.

SYNONYMS.—Poeppig distributed it from Cuba as Cyathus plicatulus, which name was changed by Tulasne when he published it. Fries claims that Cyathus plicatus, "published" by him "priorly" is the same plant.[21]

SPECIMENS IN OUR COLLECTION.

Mauritius, Chas. A. O'Connor.
German East Africa, Dr. K. Braun.
Australia, Brisbane, J. H. Simmonds.
Samoa, C. G. Lloyd.
Berlin Botanical Garden, Dr. Hennings (adventitious).

CYATHUS LIMBATUS (Plate 105).—Peridium 7-10 mm. high, conic, bell-shaped, dark brown, strigose, hirsute, often becoming smooth in old specimens. Striate within, but the external striae are hidden by the hirsute covering when young. Old specimens where this external hirsute layer has fallen away are strongly striate externally. Peridioles black, 1½-2 mm. in diameter, with a thick, outer wall. Spores elliptical, 8-10 x 16 mic. (in type). I refer here, however, specimens having spores 10-12 x 16-22.

This seems to be a frequent species in the West Indies, growing usually on the bare ground. Mr. W. Harris sends it to me in quantity from Hope Gardens, Jamaica. It often develops a brown mycelium at base, as many species do.[22] Old specimens lose the external, hirsute covering, and become smooth and striate, hardly appearing like the same plant. (Cfr., Plate 105, figs. 9 and 10.) Tulasne compares it to Cyathus Poeppigii as to cups. The cups are not so strongly striate as Poeppigii, and the striae are coarser.

SPECIMENS IN OUR COLLECTION.

Jamaica, W. Harris (in quantity), Wm. Cradwick.

NOTE.—We have received from A. Thibou, Antigua, a related plant, which we do not publish on account of the paucity of material (4 cups). It is apparently distinct, however, in its *narrow* spores, 6 x 20 mic. We hope for additional material.

CYATHUS GAYANUS (Plate 105).—Peridium about 1½ cm. high, 5-6 mm. broad, narrow, conic, dark brown, striate within and faintly without, strigose, hirsute. Peridioles black, large, 3 mm., with thick outer wall. Spores subglobose, large, varying from 20 to 32 mm.[23].

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[21] After Tulasne had published his magnificent monograph, showing how the species of Nidulairaceae can be distinguished. Fries came out with the claim that Cyathus Poeppigii was Nidularia plicata. We do not know whether it is true or not, and to our mind it is immaterial. If it is true, Tulasne gave the characters by which the plant can be recognized, and Fries gave not a single character by which it can be distinguished from any similar species. When a boy I used to play a game where the chief argument was "That is mine, I saw it first," and I think the argument is equally childish as applied to nomenclature. No man should attempt to displace careful, accurate, thorough work that can be correctly interpreted, solely on the strength of vague, indefinite work on the same subject, done at a previous date. Authors should realize that they have obligations to mycology other than "seeing new species first," and that they should not only "see" them, but should describe them, and particularly should *illustrate them* so accurately that others can "see" them. Then only should a man have the assumption to claim recognition for his "new species" on the ground of priority. I have great respect for the ***priority*** of ***good work.***

[22] On this account, perhaps, Mr. Harris' specimens have been determined as Cyathus byssisedus, described by Junghuhn from Java. I do not feel that any one is justified in deciding a plant to be Cyathus byssisedus on either the description or figure. Certainly not this plant which differs in habits from those shown by Junghuhn.

[23] Tulasne gives the measurement "15-17 x 20-22 mic." In the type I find some as large as 32 mic.

But one collection is known from Chile by Gay, which is now in Tulasne's herbarium. It was said to grow on horse manure, but it appears to me as though it grew on rich earth. Its large, subglobose spores and habitat (if true) would ally it to Cyathus stercoreus, but it belongs in a different section on account of its striate cup.

SECTION 2.

CYATHUS STRIATUS (Plate 106).—Peridium obconic, cup-shaped, dark brown (in some forms much darker than others), hirsute, strigose, with coarse, shaggy hairs, which are disposed to bend downward. Externally the cups are even; internally they are regularly and strongly striate. Epiphragm a thin, white membrane, at first strigose, but the hairs soon fall away, leaving the epiphragm smooth. The epiphragm soon breaks around the edges and falls away. Peridioles about 2 mic. in diameter, with a soft, pale tunica, which is thin on the margin and top of the peridioles, thicker below, where it usually remains attached, forming a kind of pad (when wet and swollen). The tunica rarely ruptures in the typical form of Cyathus striatus, but is generally seen entirely surrounding the ripe peridiole. Spores elliptical-ovoid, rounded at the ends, but slightly more narrow at one end than the other, 8-10 x 18-20 mic.

The type form of this plant is very common, but occurs only as far as I know in Europe. The American form is quite different, particularly in its tunica characters. I have seen no form from Australia.[24]

SYNONYMS.—This plant, like all common plants, has received a great many names through the vagaries of the old botanists. Tulasne has given the following synonyms: Peziza cyathiformis, Peziza striata, Peziza hirsuta, Nidularia striata, Nidularia hirsuta. The latest juggled name for it is Cyathia hirsuta.

Specimens in Our Collection.

Sweden, L. Romell, C. G. Lloyd.
England, Chas. Crossland, Mrs. A. Montague.
Ireland, Greenwood Pim.
Switzerland, Denis Cruchet.
Belgium, Madme Rousseau, Dr. O. Pazschke.
Germany, W. Krueger, Fritz Noack, Prof. Plöttner, Otto Jaap, Dr. O. Pazschke, C. Engelke.
Austria, A. Weidmann.
France, J. Lagarde, Rev. H. Bourdot, L. Rolland.
Portugal, Rev. C. Torrend.
Italy. Dr. C. Massalongo.

CYATHUS SCHWEINITZII (Plate 106).—I think that this plant should be considered as Tulasne has it, a variety of Cyathus striatus of Europe, although many "species" are made on much less differences. Most American botanists who were probably not aware that it differs from the European plant, have called it Cyathus striatus without distinction. Peridium pale brown, rarely dark as the European. Externally strigose, hirsute, but not so coarse as the European. Generally growing on twigs and branches to which it is attached by a brown, mycelial pad. Rarely in the ground. Sometimes I have found it on brush heaps far above the surface of the ground. (The European plant usually grows in the soil unattached to wood, sometimes on buried or half-buried wood, but never, I think, truly epixylous. Tunica very thin, early rupturing and mostly disappearing from the ripe peridiole. (The strongest point of difference between the American and the European plants is the nature of the tunica). Spores 6-8 x 18-20, averaging slightly smaller than the European form. The form "Schweinitzii," which was pointed out by Tulasne is the common form that I have always found in America. All that have reached me from American correspondents, with one exception, grew on wood. L. L. Perrine, North Dakota, sends me a collection that grew in the ground, but which agrees with the usual American form in the thin tunica. At Trexlertown, Pennsylvania, I made a collection, dark like the usual European form, but otherwise as the American.

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[24] Which is somewhat surprising to me as the other three, common species of "bird's-nest-fungi" of Europe and America are frequent in Australia also.

SPECIMENS IN OUR COLLECTION.

Canada, J. Dearness, T. N. Willing.

North Dakota, L. L. Perrine; *Wisconsin,* C. E. Brown; *Minnesota,* Dr. J. E. Crewe, Dr. M. S. Whetstone; *Massachusetts*, Clara E. Cummings; *New York*, W. H. Long, Jr.; *Pennsylvania*, Dr. Wm. Herbst, Miss E. Hodges, C. G. Lloyd; *West Virginia,* C. G. Lloyd; *Ohio,* David L. James, C. G. Lloyd; *Kentucky,* C. G. Lloyd; *North Carolina,* Mrs. M. A. Noble; *Missouri,* Dr. N. M. Glatfelter; *Iowa,* R. E. Buchanan, J. F. Clarke; *Washington,* C. V. Piper.

CYATHUS MONTAGNEI (Plate 107).—Peridium obconic, cup-shaped, 8-10 mm. high, 8 mm. broad at mouth, internally striate, externally woolly, hirsute, tawny, ferruginous color, attached to the matrix by a pad of tawny mycelium. Peridioles about 2 mm. in diameter, black with a thin tunica. Spores about 12 x 20, elliptical in the type. (In specimens from Rev. Rick they are rather ovate.)

This species is only known from Brazil, and is marked in color and habitat, growing scattered on rough bark,[25] to which it is attached by a pad of mycelium. We have plants from Rev. Rick that correspond to the type, excepting the spores are more ovate.[26] The external striae are not so marked as in most species of this section, but are evident in the type specimen, and very distinct in one collection I have from Rev. Rick.

CYATHUS NIGRO-ALBUS (Plate 107).—Peridium conic, cup-shaped, 6-7 mm. high, 4-5 mm. broad at mouth, externally strigose, hirsute, even, dark brown, almost black color. Internally silvery white (hence the name), faintly striate. Peridioles 1½ mm. in diameter, with a thin tunica. Spores elliptical, 12 x 16-22.

I collected this species in Samoa on rotten wood. It grew densely caespitose, and is strongly marked by its dark (almost black) color. In a general way it is related to Cyathus Montagnei. The spores vary much in length in same peridiole, some measuring 12 x 16, others 12 x 22. It is a rare plant in Samoa, and I saw it but once.

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[25] The specimen, fig. 1, plate 107, grew on a stick, but the original collection, as well as most we have received from Rev. Rick, grew on the rough, tree bark.

[26] We are unable to confirm Tulasne's note that there is no line of division of the spore-bearing tissue. The line in the type peridiole seems as distinct to me as in the other species. If we were guessing, we would judge from the figure that this plant is Cyathus byssisedus as illustrated by Junghuhn, from Java.

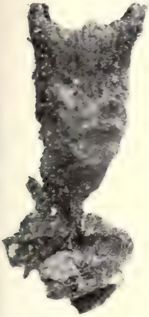

Fig. 14.

CYATHUS NOVAE-ZEELANDIAE (Fig. 14, enlarged 4 times, from the type).—Peridium 8-10 mm. high, cylindrical, cup-shaped, dark, almost black, striate, appressed tomentose. Peridioles 2-2½ mm., black, with thin tunica. Spores 6 x 12 mic., elliptical.

The type specimens grew caespitose on rough bark, and were collected by Raoul in New Zealand. The cups are darker, smoother, more cylindrical than others of this section. We have seen only the type specimens that we feel sure should be referred here. We have a very similar plant from K. Miyabe, Japan, but the material is so scanty we would prefer not to decide.

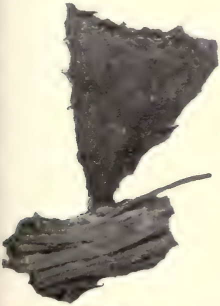

Fig. 15.

CYATHUS AMBIGUUS. (Fig. 15.—This species is known from very scanty type material. The cups are of the same general nature as those of Cyathus limbatus, but the outer peridiole walls are not formed of coarse fibrils, hence it is put in another section. It differs from all the section in its very large spores, stated by Tulasne to be 33 x 22 mic. We have not found any spores in such peridioles as we have examined. Fig 15 from the type, enlarged four times. This species was evidently doubtful to Tulasne, as its name indicates. It is also very dubious to us.

CYATHUS BERKELEYANUS (Plate 107).—Peridium 6-8 mm., high, strongly striate externally, strigose hirsute. Peridioles 1½-2 mm. in diameter, black with thin tunica. Spores very small, 4-5 x 6-8 mic. (In Mr. Millen's specimens, which we refer here, they are almost globose.)

No material is now to be found in the Tulasne herbarium, but the types are at Kew. They were collected at Rio Janeiro, Brazil, by Chas. Darwin. They are strongly striate and resemble small specimens of limbatus. The plant differs from all other species in the striate sections in its very small spores. It was called by Tulasne Cyathus microsporus var. Berkeleyanus, and while it has the peridiole and spores of Cyathus microsporus, the cups are quite different, and I think Miss White was perfectly correct in holding it as a distinct species. We have an abundant and fine collection from H. Millen, Tobago, which, however, has spores more globose than the type.

SPECIMENS IN OUR COLLECTION.

Tobago, H. Millen.

SECTION 3.

CYATHUS STERCOREUS (Plate 108).—Cups varying from cylindrical, bell-shaped, to more or less infundibuliform, sessile or stalked at the base, light brown in color,[27] covered with shaggy, woolly, matted hairs. Old specimens become smoother, and the matted hairs are not so marked. Within the cups are even and not striate. Tunica none. Peridioles *black*, about 2 mm. in diameter, with a thick, rigid, outer wall, consisting largely of rigid, deeply colored fibrils. The peridioles are usually attached to the cups by funiculi, but rarely specimens occur that have only a few of the *lower* peridioles attached, those in the upper part of the cup being destitute of funiculi. Spores *large, subglobose*, varying much in size, even in the same peridiole. In the United States the average size is 30 to 40 mic. In Jamaica and India they run from 26 to 30 mic., and in Japan they are still smaller, from 16 to 24 mic.

This is probably the most common species that grows in the United States. It is a manure-loving plant, and is found sometimes on dry cakes of manure. Usually it grows in such manured places as lawns, gardens, soil in hot houses, rubbish, etc. I have seen the manured soil under currant bushes literally covered with the little cups, extending yards in extent. It is of wide distribution in the world, and probably occurs in every country where manure occurs. It is common in Japan and Australia. I have seen it from Mexico, Madagascar, Jamaica, Africa, Antigua, India and South America. It occurs in Europe, but strange to say, is a *very rare plant* in Europe.[28]. While there is no real resemblance between this plant and Cyathus vernicosus, it is often confused with vernicosus.[29] However, there are no good reasons whatever for confusion with vernicosus if attention is paid to the spores.

FORMS.—It is very constant in its leading characters, viz: the nature of the shaggy coat of the cup, the thick, peculiar, outer peridiole wall, the large, subglobose spores. It varies so much as to size and shape of the cups that scarcely two collections are the same. The form, with a stalked cup, slender and infundibuliform, was called by Tulasne Cyathus Lesueurii. Taking our idea of this form from Tulasne's specimens, we would consider the other extreme form, which grows on cakes of manure and is unstalked, short and subcylindrical as the type form of Cyathus stercoreus. So many intermediate forms occur, however, that the larger part of the collections we receive we would not know whether to call stercoreus or Lesueurii. There are many small forms which Tulasne called "var. minor," but there is no such thing as separating the various collections. Plants from the extreme South, from Florida and Texas, are usually the small form.

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[27] The specimens I received from G. A. Gammie, Poona, India, were of so light a color that I did not recognize them at first.

[28] I have it from but three of my correspondents in Europe. At Kew there is but a single collection made in Europe, and at Paris not one.

[29] Thus Ravenel's herbarium has many collections of Cyathus stercoreus labeled Cyathus vernicosus. It was twice distributed thus misnamed by Ravenel and twice by Ellis. Miss Marshall's illustration of vernicosus is evidently stercoreus. The photogravure that we sent out (No. 7) many years ago as Crucibulum vulgare was made from Cyathus stercoreus. (See correction, p. 88, Myc. Notes.)

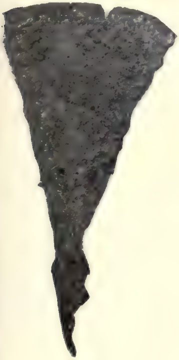
Fig 16.

SYNONYMS.—The following we consider synonyms: Cyathus melanosperma (Nidularia melanosperma, Trans. Am. Phil. Soc. 4-253), based on specimens where the spores average large.[30] Cyathus affinis (Madagascar) based on specimens where the spores average small and not so globose as usual. Cyathus Wrightii (Grev. 2-34) based on sterile[31] specimens (Fig. 16, type X 4), Cyathus rufipes (Bull. Torr. 97-125), based on specimens with spores averaging rather small, and with slight development of brown mycelium at base.[32] Cyathus Baileyi (Grev. 21-3).[33] Cyathus Puiggarii, one of Spegazzini's productions from South America, we have not seen, but the description and habitat is exactly that of Cyathus stercoreus, and we have Cyathus stercoreus from the same section.

FORMS OF CYATHUS STERCOREUS.

CYATHUS LESUEURII (Plate 108).—As we have previously stated this form (typically) differs from Cyathus stercoreus in its shape, but so many intermediate forms occur that it is not practicable in naming specimens to keep it distinct. In our plate we give photographs of the type material, which is abundantly preserved at Paris.

CYATHUS RUFIPES (Plate 108).—The type specimens of Cyathus rufipes have the brown mycelium at the base hardly developed out of the ordinary,[34] and were this the only collection we had seen with this character, we would not consider it with a separate name. We have received specimens from C. E. Pleas, Florida, with such a strong development of this mycelium that it forms a large ball at the base of the plant, and as it is the same idea (in an intensified form) that Ellis had when he named the Kansas specimen, we use the name. The plants are stalked, more slender than the form Lesueurii and each at its base has a large ball of reddish brown mycelium, ½ cm. in diameter. The spores are immature, but from the nature of the cup and the structure of the peridiole, I do not hesitate to refer it to a form of stercoreus. Two species have been previously named from the habit that Cyathi have of developing a pad of brown mycelium at the base! Cyathus byssisedus from Java, and Cyathus subiculosus, which was adventitious in the Botanical Garden at Bruxelles, on some earth from Mexico. In the former plant the development of mycelium, I judge from the picture, was not out of the ordinary, but in the latter plant the mycelium forms a large ball about twice the diameter of the little, subglobose cup that is seated upon it. Neither is accompanied by any spore or other characters from which any idea can be obtained of the relationship of the plants.

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[30] We can note no difference in the general size of spores from type material of Cyathus stercoreus and Cyathus melanosperma. While in the latter there are many large spores there are also small ones and some we note measure not over 20 mic.

[31] We have examined two peridioles from the type specimens and found them both sterile. Professor Farlow, at our request, has kindly made an examination of the co-types in the Curtis collection and finds them all sterile. We are unable to explain the spore measurements, 10 x 15 mic. as given, but think it is an error, for with the same cups, peridioles and peculiar outer peridiole walls of Lesueurii we have no doubt of its identity. In addition peridioles of the *large* spored Cyathi are *frequently* sterile, while it is a character of *all small* spored species that the spores are always abundant. Miss White has given a really comical drawing of Cyathus Wrightii. Compare fig. 16, photograph of the type specimen with her figure.

[32] All species of Cyathus, I think without exception, if they grow on a hard matrix, such as a piece of wood, straw, etc., develop brown mycelium at the base. Growing on the earth this is not usually developed. Taken alone the brown mycelium at the base of a Cyathus is no character whatever.

[33] I found no specimens so labeled at Kew. The only collection from "Bailey, on manure," is labeled Cyathus fimetarius and is Cyathus stercoreus.

[34] See note 32 above.

SPECIMENS IN OUR COLLECTION.

Canada, T. N. Willing.

Vermont, E. A. Burt; *New Hampshire,* C. E. Montgomery; *Connecticut,* E. P. Ely, C. E. Preston; *Minnesota,* Dr. M. E. Whetstone; *Massachusetts,* Clara, E. Cummings; *New York,* W. N. Clute; *Pennsylvania,* C. H. Baker; *New Jersey,* H. A. Bird, F. K. Vreeland; *Washington, D. C.,* Flora L. Patterson, F. J. Braendle; *Ohio,* A. P. Morgan, Mrs. A. J. Wolfert, Frank Huntsman, W. C. Dawson, C. G. Lloyd; *Kentucky,* C. G. Lloyd; *South Dakota,* L. W. Carter; *North Dakota,* J. F. Brenckle; *Nebraska,* Rev. J. M. Bates; *Kansas,* E. Bartholomew (type of Cyathus rufipes); *North Carolina,* Miss Mary Fitzgerald; *Florida,* Mrs. M. A. Noble, Theo. L. Mead, Mrs. Sams, C. E. Pleas (Cyathus rufipes, see Plate XXX); *Texas,* W. H. Long, Jr., J. W. Stiles; *California,* S. B. Parish.

Italy, M. Bezzi, Dr. C. Massalongo.

France, Capt. Pyat Felix.

Japan, T. Ichimura, Toji Nishida, J. Yoshinaga (2 collections), K. Miyabe (2 collections), S. Kusano (3 collections).

South America, Argentine, Theo. Stuckert.

Jamaica, W. Jekyll (3 collections).

Antigua, A. Thibou.

Madagascar, Ex. Herb, N. Patouillard (type of Cyathus affinis).

Africa, Zambesi Falls, from Professor Massee.

Australia (While I have received no specimens, there are a number at Kew).

British India, G. A. Gammie.

SECTION 4.

This section only occurs in the tropics. The plants are very much alike as to cups, having *pale-colored* cups with *spreading, hispid* hairs. The difference is chiefly in the spores, and while this difference is very marked in the few collections we have, it will probably prove that when abundant material is received the spore sizes and shapes run into each other, so that it is not practicable to maintain "species" on spore characters alone. At the same time we would not feel justified in throwing them together from the collections that we have.

CYATHUS PALLIDUS (Plate 109).—Peridium pale-colored, campanulate, 6-7 mm. high, 5-6 mm. broad at mouth, blotched with spreading hairs at first dense, but at length becoming thinner and scattered. Cups even within and without.[35] Peridioles about 2 mm. in diameter with very thin tunica and thin, single walls. Spores small, elliptical, largest about 7 x 10 mic., smallest about 5 x 8 mic.[36]

Originally described from Cuba (Wright, 684), we have the plant also from Jamaica and Antigua. Miss Barrett's specimens (Plate 109, figs. 3 and 4) from Jamaica, have notably smaller, more urn-shaped and more hispid cups than usual, but we do not feel like separating them under a distinct name. Cyathus pallidus, while well named, would be better named if it were called hispidus, for the strong character is the rigid, spreading, hispid hairs.

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[35] The specimens I have from Jamaica are perfectly even within. The type specimens appear *very slightly* striate, but the plant belongs in the section "Olla," not in Eucyathus as found in Saccardo.

[36] The spores are described as "subglobose, 10 mic." but my examination of the type which agrees with Miss White's measurements of the co-types shows them rather elliptical.

SPECIMENS IN OUR COLLECTION.

Jamaica, H. C. Cox, Miss Barrett, Wm. Harris. (I find a few cups of this species mixed with a very abundant collection of Cyathus limbatus, sent by Mr. Harris.)
Antigua, A. Thibou.

CYATHUS INTERMEDIUS (Plate 109).—Peridium broad, campanulate, 5-6 mm. high and broad at the mouth, even within and without. (Sometimes faintly striate within.) *Pale* fawn color, covered when young with appressed, tomentum, *collected in nodules.* This character largely disappears from old specimens. Peridioles thin, about 2 mm. in diameter, with a thin tunica. Spores in the type collection, elliptical, 10 x 16 mic.[37]

The type specimens are found in Montagne's herbarium, and were collected in Cuba, and called by Montagne Nidularia intermedia. It is a peculiar species, well characterized by the *pale, nodular* tomentum when young. When old the cups resemble Cyathus pallidus, from which it is readily distinguished by its larger spores. Tulasne placed the species in the section "Eucyathus," but the striae are absent in most specimens, and when present are so faint that I think the plant should go in "Olla."

SPECIMENS IN OUR COLLECTION.

Bahamas, L. J. K. Brace.
Cuba, F. S. Earle ("on dirt and sides of an old seed box").

CYATHUS TRIPLEX (Plate 109).—Cups 5-6 x 5, even within and without, with connivent, spreading, somewhat scabrous hairs. Inner surface even, silvery white. Peridiole 2 mm., with a very thin, adnate tunica. On soaking in water the tunica swells and becomes white and loosens up. Cortex thick, evidently double, but subhomogeneous and the fibrils slender. Spores elliptical, 12-14 x 16-22.

These specimens are from Mauritius, and grew caespitose attached to twigs and roots. It is a doubtful species to me, being too close to both the preceding. The cups are those of pallidus, but darker and the hairs more scabrous. The spores are close to intermedius, though larger, but the tomentum of the young cups is quite different.

SPECIMENS IN OUR COLLECTION.

Mauritius, Chas. A. O'Connor.

CYATHUS SPHAEROSPORUS (Plate 109.)—Cups small urn-shaped, 5 x 4 mm., contracted at the base, and attached to the matrix with a pad of pale-colored mycelium. Externally even, pale, and clothed with somewhat matted hairs. Even within. Peridioles 2 mm., with thin tunica. Cortex single. Spores *subglobose,* 15 x 16 mic. Some more elliptical.

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[37] Specimens received from L. J. K. Brace agree with the type both as to cups and spores. Specimens from F. S. Earle have typically the same peculiar cups, but the spores vary much. Most of them are elliptical, 8–10 x 18 mic. but many occur much shorter and some subglobose about 9 x 10 mic.

This plant resembles the small form of Cyathus pallidus so closely it can hardly be distinguished by the cups, save the hairs are not so rigid and hispid. It has much larger, more globose spores. In the first peridioles I examined I found all the spores subglobose, but in examinations since, from same cups, I have found other spores decidedly elliptical.

SPECIMENS IN OUR COLLECTION.

Jamaica, W. Jekyll.

SECTION 5.

CYATHUS VERNICOSUS (Plate 110).—Cups broad, campanulate, 10-15 x 8-10, often flaring at the mouth, thick, rigid. Externally even, smooth, gray fawn color, with fine appressed hairs. Within smooth, even. Peridioles *large,* 2½-3½ mm., with a thin, uniform, closely adnate tunica. Cortex thin, a single layer. Spores ovate, 6-8 x 10-14.

In Europe this is the most common species. In the United States it is frequent, but not so common as stercoreus. It occurs also in Australia, South Africa, South America, and doubtless many other countries. It generally grows on the ground, sometimes on chips, etc., but it is the only species likely to be found in temperate regions in unmanured ground. It is easily recognized by its smooth, even, rigid cups and large peridioles.

SYNONYMS.—The old botanists illustrated the plant many times, each usually giving it a new name. Tulasne has collected these together, and cites the following synonyms. Peziza tertia, Peziza lentifera, Peziza cyathiformis, Peziza sericea, Peziza olla, Cyathus laevis, Nidularia vernicosa, Nidularia campanulata, Cyathus olla, Nidularia plumbea, Nidularia olla, Cyathus campanulatus. These references in extenso were copied in a recent monograph, but I do not think they are worth rehearsing in detail. They should have died and been forgotten after Tulasne had pointed them out. Since Tulasne's monograph, mycologists have mostly quit discovering that it was a new species, and have generally taken Tulasne's name, Cyathus vernicosus. Every now and then some one gets out his little date dictionary and calls the plant Cyathus olla, Cyathus campanulatus or Cyathus laevis, according to the degree of a priorist he happens to be. Having passed the "new species" era, the plant is just entering the name-juggling era. The latest in that line is Cyathia lentifera. Miss White states that Schweinitz's species Nidularia fascicularis (Cyathus fascicularis) is a synonym. I have seen only a very poor specimen, but the peridioles have the same structure and spores as C. vernicosus, and I do not question the correctness of it. Cyathus similis was said by the author to be very close. It seems so to me, so close I can note no difference.

FORMS OF CYATHUS VERNICOSUS.

The plant is quite variable in the size and shape of the cups and to a degree the color. Tulasne distinguishes four varieties which I have not found practicable to distinguish. From England I have a collection with cups very much like Cyathus stercoreus in general appearance, which is the only collection I have seen that could well be confused with that species. From Rev. H. Bourdot, France, I have a collection whiter in color and with softer hairs than usual.

CYATHUS DASYPUS.—Nees von Esenbeck illustrates a plant from South Africa under the above name, which seems both from his description and figure to be the ordinary form of Cyathus vernicosus. Tulasne has applied the name to a plant from Chile, agreeing with Cyathus vernicosus, excepting it has more irregular peridioles. I hardly think it merits a name even as a variety, but if it does I see no harm in applying Cyathus dasypus to it in the sense of Tulasne, though there is nothing in the original to indicate that the peridioles are irregular.

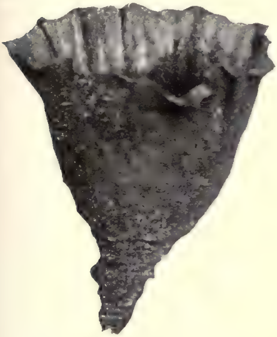

Fig. 17.

CYATHUS ANGLICUS (Fig. 17, enlarged 4 times).—At Kew I noted several collections of Cyathus vernicosus, made in England, with large, *sulcate* cups. While the cups might well be described as striate, they have no relation to the section Eucyathus. I think this form is solely English, for I have seen no specimens from any other locality. The plant Miss White illustrates from Colorado under the name Cyathus dura seems to me very much the same nature.

Specimens in Our Collection.

Minnesota, M. S. Whetstone; *Wisconsin,* Chas. E. Brown; *Michigan,* E. E. Bogue; *New Hampshire,* H. E. Warner; *New York,* W. N. Clute, W. H. Long, Jr.; *Pennsylvania,* Dr. Wm. Herbst; *Washington, D. C.,* C. L. Shear; *Maryland,* W. T. Lakin; *Ohio,* C. G. Lloyd; *North Dakota,* Lura L. Perrine; *Colorado,* E. B. Sterling; *Nevada,* P. B. Kennedy; *California,* Edw. M. Ehrhorn, Miss Rose H. Lane, C. G. Lloyd.

Denmark, Rev. A. Breitung, Rev. J. Lind.

Ireland, Greenwood Pim.

England, Chas. Crossland, Unknown donor

Belgium, Chas. van Bambeke, Paul Nijpels.

Switzerland, Denis Cruchet.

Germany, Otto Jaap, C. Engelke, Prof. Plöttner.

Austria, A. Weidmann.

France, G. Renaudet, E. Boudier, N. Patouillard, Rev. H. Bourdot, A. Acloque.

Spain, Rev. L. Navas, Prof. T. de Aranzadi.

Italy, Dr. G. Scalia, Dr. C. Massalongo.

New Zealand, Miss Jessie Dunn.

Australia, Adelaide, A. Zietz.

(Mr. Zietz sends me seven abundant collections, and it is surely the most common bird's-nest fungus in the vicinity of Adelaide.)

CYATHUS COLENSOI (Plate 110).—Cups broad, campanulate, 5-6 x 6-7, even, smooth, with appressed, fine hairs. Even within. Peridioles about 2 mic., black with thin tunica (?). Cortex thick, a single layer. Spores varying much as to size and more as to shape. Many elliptical, 8-10 x 10-12 mic. Many subglobose, 9-12 mic. in diameter.

This species has much the same cups as vernicosus, but smaller peridioles and more globose spores. I saw a number of collections from Australia at Kew, and have received it once.

SPECIMENS IN OUR COLLECTION.

Australia, F. M. Reader.

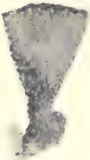

Fig. 18.

CYATHUS MINIMUS (Fig. 18, enlarged 4 times).—Cups very small, 4-5 x 4 mm., even, smooth. Clothed with subappressed hairs. Even within. Sporangioles small, about 1 mm., with thin tunica. Cortex thick, 50 mic., but apparently a single layer. Spores elliptical, 10-12 x 18-20 mic.

This little species is known only from the original collection, made in China.

SPECIMENS IN OUR COLLECTION.

China, Type from Herbarium. Professor Patouillard.

CYATHUS PYGMAEUS (Plate 110).—Cups small, 4-4½ x 3½-4 mm., grayish brown, even, smooth, rigid, clothed with appressed hairs. Even within. Peridioles small, about 1 mm., with thin tunica. Cortex a single layer, about 30 mic., thicker on the lower side of the peridiole. Spores small, ovate, 8-9 x 12-14.

This little species reaches me from C. V. Piper, Pullman, Washington. It grew attached to twigs in moss. It is close to the preceding, differing chiefly in its spores. It is the only collection of Cyathus I have ever received from the United States that can not be referred (as a form at least) to one of the three common species.

SPECIMENS IN OUR COLLECTION.

Washington, C V. Piper.

CYATHUS EARLEI (Plate 110).—Cups campanulate, rigid, 7-8 x 6-8 mm., *dark,* blackish brown. Externally even, scabrous, with short tomentum. Internally smooth or faintly striate (but having no affinities with the section Encyathus), white, contrasting with the dark exterior. Peridioles covered on the upper side with a silvery, thin tunica. Cortex thick, double, the outer thin, composed of small fibrils. Spores elliptical or slightly oval-elliptical, 12 x 24-32 mic.

This species in its shape and rigid cups is related to vernicosus, differing much in color and spores. We have received two collections, one from Cuba, the other from Hawaii. They are the same otherwise, but do not accord exactly in spores. The Hawaiian specimens have narrow, elliptical spores, mostly 12 x 32, some 12 x 28. The Cuban spores are elliptical-oval, mostly 12 x 24, few 12 x 28. We do not think it practical to separate them.

SPECIMENS IN OUR COLLECTION.

Cuba, F. S. Earle.
Hawaii, F. W. Terry.

CYATHUS CANNA (Plate 110).—Cups campanulate, rigid, 7-8 x 6-8 mm., dark brown. Externally even, scabrous with short tomentum. Internally smooth, even, white as if covered with a thin layer of whitewash. Peridioles covered on the upper side with a silvery, thin tunica. Cortex double, the outer, thin, composed of small fibrils. Spores *small, globose*, 7-9 mic.

This plant grew in the earth, and is very similar to the preceding in its cups, differing in its spores. It is close to microsporum, excepting habitat and the shape of the spores.

SPECIMENS IN OUR COLLECTION.

Barbados, L. Lewton-Brain.

CYATHUS MICROSPORUS (Fig. 19).—Cups 7-8 x 6-7, even, dark brown. Externally even with appressed hairs. Internally not striate, even. (It surely does not belong in the section Eucyathus.) Peridioles 1½-2 mm., with a thin tunica. Spores elliptical, very small, 4 x 6.

The type specimens (Fig. 19, enlarged four times) were collected on the Island of St. Domingue by Mr. Poiteau and grew caespitose on rotten wood. They are now in Tulasne's herbarium at Paris.

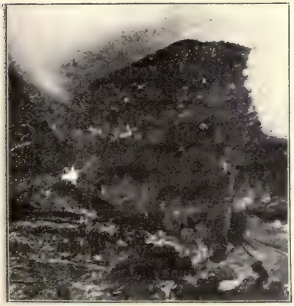

Fig. 19.

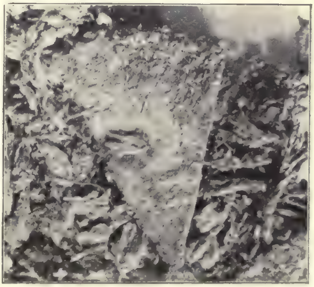

Fig. 20.

SYNONYMS.—Tulasne called this plant Cyathus microsporus var. domingensis to distinguish it from plants with the same spores which he received from

Berkeley, which he called Cyathus microsporus var. Berkeleyanus. The two collections have entirely different cups, and in our opinion should be treated as species. It is an evidence of the stress that Tulasne placed on spore characters more than on the grosser characters of the plants, but we are inclined to place stress just the contrary.

CYATHUS HOOKERI (Fig. 20).—Cups thin, obconic, strongly tapering to the base, where they are attached by a small pad of mycelium. Light in color, with a matted tomentum. Spores 6 x 8. I know this plant only imperfectly from the types at Kew (Fig. 20, enlarged 4 times) which are pressed flat. It grew on dead wood, on moss and lichen, covered with sawdust at Khasa, India, and was collected by Dr. Hooker. It was placed in Eucyathus, but I can note no striations. It was described as "striate or all even." I think it should go in "Olla." It seems to me close to microsporus, but larger spores and different cup.

THE GENUS SPHAEROBOLUS.

This genus is very different from all that precede, and by several authors is not included in the Nidulariaceae. The plants are little, globose, sub-fleshy cups, each including a *single peridiole*. The structure of the peridiole is very similar to that of others of the family, and to my mind the genus should be classed as a *one-peridioled* Nidulariaceae. The appearance of the plants, however, is quite different from others we have considered, and would not in the popular mind, at least, be associated with bird's-nest fungi.

SPHAEROBOLUS STELLATUS (Plate 111).—Peridium fleshy, globose, about 1½-2 mm. in diameter. When fresh, yellow, becoming pale or white when dried, each containing a single peridiole. The walls of the peridium are said to be double, the inner separating and inverting suddenly, projecting the peridiole to some distance.[38] Peridioles in dried specimens about 1 mm. in diameter, reddish brown.[39] Their structure, while so analogous to that of other Nidulariaceae as to leave no doubt in our mind as to their classification, is different in many respects. The peridiole wall is not hard and horny, but rather fleshy, and not fibrillose in structure. In a section it appears yellowish. The interior is one homogeneous mass of spore tissue, not separated into an outer, sterile portion as in all other genera. The spores are very numerous, appearing to compose the greater part of the tissue. They are elliptical or broadly ovate, irregular in size, and vary from 5 x 6 to 6 x 10 mic.

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[38] This at least is the usual explanation of the dehiscence of this plant. It is thus shown by Micheli, two hundred years ago, but whether the popular idea is taken from this old picture, or is based on observations of the fresh plant, I do not know. I never saw fresh specimens but once, and then did not observe them as closely as I would now if I had the opportunity. I made a short note, as follows: "These plants are globose about 2 mm. in diameter, and look like little yellow eggs. When ripe the peridium splits at the top in a stellate manner and ejects the single yellow peridiole." I can not detect on the photograph I made from these fresh specimens (Plate 111, fig. 1) any evidence of the "inverted inner layer," nor do I find any on all the dried specimens that I have. That the peridiole is *ejected*, however, in some manner, I think is well established. I have seen somewhere where a French author states that he placed some fresh specimens in a dish and covered it with a pane of glass at some distance (two or three inches) and that the peridioles were ejected with such force that they adhered to the glass.

[39] My note from fresh specimens gives their color as "yellow."

FORMS.—There are a number of forms (or may be species) that seem to differ chiefly in habits and habitat. The type form grows on rotten wood, scattered or caespitose, spread over the surface and attached with a little pad of white (yellow when fresh) mycelium. This is the most common form that reaches me. There is another form that grows more scattered and deeply immersed in the wood. This is called Sphaerobolus tubulosus. Another form in which the mycelium forms a dense matrix in which the little peridia are densely seated. It forms over damp, mossy ground in woods. Another form on manure (Sphaerobolus stercoreus) usually partially immersed. Another form on bare ground, forming very little mycelium (Sphaerobolus epigaeus). Whether these forms are "species" or only conditions due to various habitats, I can not state. They all appear very much the same from dried specimens.

HISTORY.—Micheli first illustrated the plant about two hundred years ago under the generic name Carpobolus, which should have been retained, but has been lost, due chiefly to bad work on the part of Linnaeus, who placed the plant in the genus Lycoperdon (sic), and called it Lycoperdon Carpobolus. The plant is now often called Sphaerobolus Carpobolus, sometimes Carpobolus stellatus, but more generally Sphaerobolus stellatus.[40] The following are also synonyms Professor Patouillard tells me: Sphaerobolus cyclophorus (Carpobolus cyclophorus). The following are given as synonyms in Saccardo: Carpobolus albicans, Carpobolus stellatus, Sphaerobolus impatiens. (The latter is given by Dr. Hollós as Sphaerobolus impaticus. I have not looked it up.) Sphaerobolus dentatus is the climax of a series of errors.[41] When the name-jugglers get to work, I presume they will call the plant Carpobolus Carpobolus or something else equally absurd.

SPECIMENS IN OUR COLLECTION.

Louisiana, Rev. Langlois (on cow manure).
Sweden, L. Romell.
Belgium, Madame Rousseau.
France, Capt. Pyat Felix, Rev. H. Bourdot.
Germany, Otto Jaap (4 collections), Dr. O. Pazschke, C. Engelke.
Bohemia, F. Bubak.
New Zealand, Robt. Brown (S. epigaeus).

EXCLUDED GENERA.

There are a number of genera given in Saccardo that are said to not belong to the Nidulariaceae. I know nothing about them. Thelebolus is said to be an Ascomyces; Dacryobolus to belong to the Hydnaceae; Polyangium to be a Myxobacteraceae (whatever that may be); Atractobolus, "ist ganz unklar," etc.

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[40] "According to the principles of priority the name of this genus is Carpobolus (Mich. 1729), but the name Sphaerobolus (Tode 1790) is so well established and so widely spread in literature, that I defer to general usage and retain the name Sphaerobolus."—HOLLÓS.

Good logic, Doctor! If you had always followed as good judgment, Mr. McGinty would have had nothing to say.

[41] Started by Withering more than a hundred years ago, it has kept on growing through several authors, each adding a little to it and making it worse, until finally it was served up in its completed form recently to the readers of the English Journal of Botany.

ADVERTISING SUPPLEMENT.

We have strongly opposed the prevailing custom of adding personal names to the names of plants, owing to the amount of inferior work to which it leads. We think that a binomial name alone should indicate a plant and should have a specific meaning, and that in selecting names authors should be influenced by no other consideration than the proper classification and the specific designation under which the plant is best known. Under this system we believe that in a reasonable time botanical nomenclature would become definite, *as all other languages* have become by a similar process. Under the present system each author is mainly interested, *not* in using the names used before, but in getting up new ones to which to add his own. It is as easy to shuffle names, both specific and generic, as to move about the men on a checker board. The result is an ever-changing language, and almost every one who writes on the subject uses largely his own names.

In the Nidulariaceae, the man who brought system out of chaos was Tulasne, sixty years ago. Since his monograph, I feel that his names should be adopted so long as his genera are accepted, which will probably be always. Most botanists, even if they get their information from Tulasne and follow him, feel it incumbent to add a personal name *taken from Tulasne.* To these we indicate the proper name to add to the species in this pamphlet.

Tulasne to Crucibulum vulgare, Cyathus ambiguus, Berkeleyanus, Gayanus, intermedius, limbatus, microsporus, Montagnei, novae-zeelandiae, Poeppigii, Lesueurii, Schweinitzii, Nidularia australis and Duriaeana; *Berkeley* to Colensoi, Hookeri, pallidus, Nidula emodensis; *Patouillard* to minimus and Nidularia Heribaudii; *Schweinitz* to stercoreus; *Ellis* to rufipes; *Hudson* to striatus; *Nees* to dasypus; *Peck* to Nidula candida and microcarpa; *Massee* to Nidularia fusispora; *Roth* to Nidularia pisiformis and *Tode* to Sphaerobolus stellatus. For the remainder it does not matter much.

THE LLOYD LIBRARY AND MUSEUM.

This institution, while nominally an incorporated organization, is in reality dependent upon the support of two brothers, C. G. and J. U. Lloyd, who provide the funds for its maintenance, each for his own department; the former Botany and especially Mycology, the latter Materia Medica and Pharmacy. The institution is located at No. 224 West Court St., Cincinnati, Ohio, and is a four story building erected by Mr. C. G. Lloyd for this purpose in 1902.

THE LIBRARY.

This is in charge of Captain William Holden, Librarian. It is devoted exclusively to the aforementioned subjects, and although of comparatively recent growth, it compares favorably, in number of volumes at least, with such old established libraries as are to be found at Kew. In monetary value, or in practical working value to the systematic botanist, the Lloyd Library does not compare with Kew, for the latter is a selected library of years of growth, devoted specially to the wants of the systematic botanist. The Lloyd Library aims eventually to embrace all books relating to botany, pharmacy, materia medica and allied sciences. With this object such subjects as physiological botany, elementary text books, technical botany, pharmacopoeis, etc., which would not be considered as in the scope of Kew are systematically collected in the Lloyd Library.

THE HERBARIUM.

This consists of about thirty thousand specimens (estimated) which were mostly obtained through exchange by C. G. Lloyd during the earlier years of his life. When Mr. Lloyd became interested in Mycology, some ten years ago, this feature was practically abandoned. Prof. W. H. Aiken has recently taken charge of this department and it is expected that from this time on the herbarium will have renewed life and activity.

Lloyd Library and Museum.

THE MUSEUM.

One floor of the building is devoted to a museum of fungi and there have accumulated many thousand specimens. During recent years Mr. C. G. Lloyd has devoted himself exclusively to the study of Gastromycetes, popularly known as the puff ball family. With the cooperation of a large number of correspondents from every country in the world, more specimens of these plants have found their way to this museum than can be found in all other museums in the world combined. Each specimen is named, and labeled with the name of the collector and locality, and is preserved in the museum, no matter how well the same species may be represented. Some common species, such as Lycoperdon gemmatum, are represented by over three hundred different collections.

ITS DESTINY.

This institution will never be sold or broken up. When the life works of its builders are finished, funds will be provided for its continuance under the care of some institution or university, best calculated to serve science. The entire collection of books and specimens is pledged by its founders to be donated intact to Science.

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THE PHALLOIDS OF AUSTRALASIA

An account of what is known, or rather what
little is known, of the subject, and illustrations
(more or less accurate) of the
species that have been figured

By

C. G. LLOYD

CINCINNATI, OHIO, U. S. A.

JULY, 1907

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

INTRODUCTION.

The object of this pamphlet is to state what is known, or rather what little is known about the phalloids of Australia and New Zealand. Practically all that has been published is based on the specimens now preserved at Kew and the British Museum which were originally studied by Berkeley. Excepting what he wrote, now forty or fifty years ago, little has been written on the subject. It was brought together in Cooke's Handbook of Australian Fungi, but the account is quite inaccurate, and I think it well to present the subject in the light of the recent knowledge of phalloids. While very little has been added to our knowledge of Australian phalloids since Berkeley's day, in other portions of the world the phalloids have become much better known. While we have but little additional material from Australasia with which to work, we can consider it in the light of what has since been learned of phalloids, many of them the same species, from other countries. In this pamphlet we shall not endeavor to give technical descriptions of Australian phalloids. We shall indicate the species that are reputed to be Australian, with running remarks on their history and such evidence as exists in Europe regarding them. We shall reproduce the figures that have been made, and after all a figure is the best description that can be given of a phalloid.

There are at Kew forty-five collections of Australasian phalloids; at the British Museum there are six, not counting the duplicates of collections at Kew; at the Museum of Paris four, making a total of fifty-five collections. These are practically all there are in Europe and it is needless to say that the phalloid flora of a country embracing more than three million square miles is not well known from fifty-five collections. Of the thirty-four species and forms supposed to occur in Australia ten are represented by a single collection and sixteen are known only from descriptions and figures, and of most of them probably no specimens exist.

THE NATURE OF PHALLOIDS.

It is not necessary here to enter into any technical, botanical discussion as to what constitutes a phalloid. Most of the readers are familiar with this class of fungi, and those who are not will recognize them as soon as they look at our pictures. They are always soft, fleshy fungi that often are developed in a short space of time, usually during a night. They assume most striking and bizarre shapes, are often bright colored, and usually emit a most fetid and unpleasant odor. In short, any fungus that is attractive to the eye by its odd shape or bright colors and is repulsive to the nose is safely a phalloid.

DEFINITION OF TERMS.

In the description of Phalloids it is necessary to use a few botanical terms, but they are simple and will be readily understood from the following explanation.

VOLVA.—All phalloids, at least all considered in this pamphlet, when young are enclosed in a subglobose membrane called the volva. In this state a phalloid can well be compared to an egg, in fact it is customary to speak of young phalloids as "eggs." The volva or shell, however, is a soft, thick, gelatinous membrane. When the plant develops the volva bursts at the top and remains as a cup at the base of the mature phalloid. All our pictures of phalloids show the volva at the base of the plant, at least all pictures that were made from perfect plants. If there is no volva at the base it is because the illustration was drawn from an imperfect specimen.

RECEPTACLE.—This is a term that is applied to the portion of the plant that bears the greenish, mucilaginous mass (called the gleba). In some phalloids (such as Clathrus) the entire plant, exclusive of the volva, forms the receptacle. In others, such as Simblum, the receptacle is borne on a stem. Some phalloids are a simple, stem-like structure and bear the gleba directly on the upper portion, then of course the upper portion of the stem is the receptacle.

GLEBA.—This is a greenish, viscid, fetid substance with which all phalloids are supplied. It is in fact the fruiting portion of a phalloid, for it contains innumerable, microscopic spores which are analogous to the seed of flowering plants. It is the gleba of a phalloid that is usually so excessively fetid. This bad odor, as offensive as it may be to us, serves a useful purpose to the plants, as it attracts flies and other insects that are the means of the dispersion of the spores.

STEM.—The stem (or stipe) of a phalloid needs no special explanation. It is used in the ordinary sense of the word. Some phalloids have no stems.

PILEUS.—There are some phalloids (the genus Phallus) that have the gleba borne on a special membrane on the top of the stem. This is usually conical or hat-shaped and is called the pileus.

VEIL.—A most striking feature in a few species that have pilei is a thin, net-like membrane that hangs from under the pileus and spreads out as a net around the stem. It is called the veil (or more correctly the indusium) but we prefer to call it the veil.

THE GENERA OF PHALLOIDS.

There are but a few genera of phalloids, and they are all based on the general shape of the receptacle. The ideas of classification are extremely simple, and will be readily understood from the following table and references to the pictures that represent the various species. In the following table we give only the genera that occur (or have been so recorded) in Australasia. However, when the subject becomes well known other genera will doubtless be found there.

Phalloids can be divided into four groups of genera.

1st, The Simple Stem Section.—Gleba borne directly on the upper portion of a simple stem or on a pileus borne on the top of a simple stem.

Gleba borne on a special pileus........................*Phallus.*
Gleba borne directly on the upper portion of the stem.
No pileus ....*Mutinus.*

2d, The Lobed Section.—Gleba spread over, or on the inner surface, of free arms or lobes at the apex of the stem.

Stipe a columnar tube bearing free arms at the top.....*Lysurus.*
Stipe a hollow, flaring tube, the limb lobed...........*Anthurus.*
Stipe bearing a disk-like expansion, the limb divided
into lobes or segments..............................*Aseroe.*

3d, The Columnar Section.—Receptacle consisting of simple, vertical columns, united at the top.

Columns sessile ....*Laternea.*
Columns united at the base into a distinct stipe.....*Pseudocolus.*

4th, The Clathrate Section.—Receptacle in the form of a clathrate or latticed structure.

Entire receptacle one clathrate structure..............*Clathrus.*
Clathrate structure borne on columns which are united
into a hollow tube at the base......................*Colus.*

THE GENUS PHALLUS.—This which is the original or type genus of Europe is very readily known from having the gleba borne on a conical or bell-shaped pileus at the apex of the stem. All species have a veil probably, at least rudimentary, and some a strongly developed veil hanging from under the pileus. The latter have been erected into a separate genus (called Dictyophora), but to me it seems simpler to call them all Phallus, as formerly.

Section 1, Veil Long, Conspicuous. Dictyophora of Many Books.

PHALLUS INDUSIATUS (Fig. 1).—Pileus broadly bell-shaped, rugulose-reticulate. Veil, long, white, spreading with large meshes. Stipe white. This is a most striking plant, and occurs probably in every warm country in the world. It takes many forms and has many names, and we use the first name under which it was well illustrated, viz: by Ventenat in 1798. Its occurrence in Australia is based on specimens at Kew collected Endeavour River by Mueller

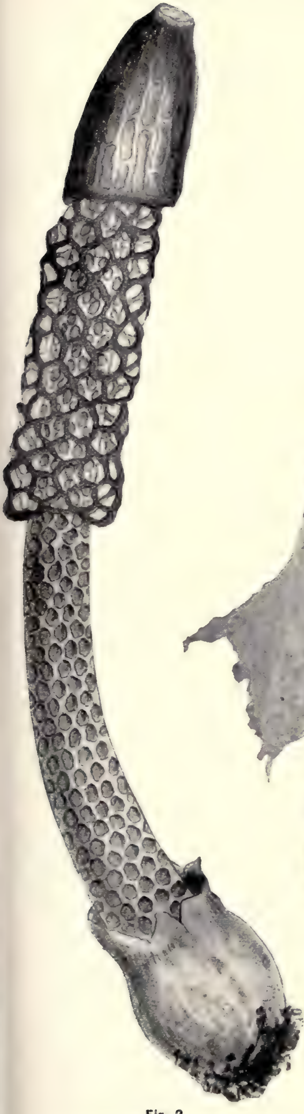

Fig. 2

PHALLUS MERULINUS.

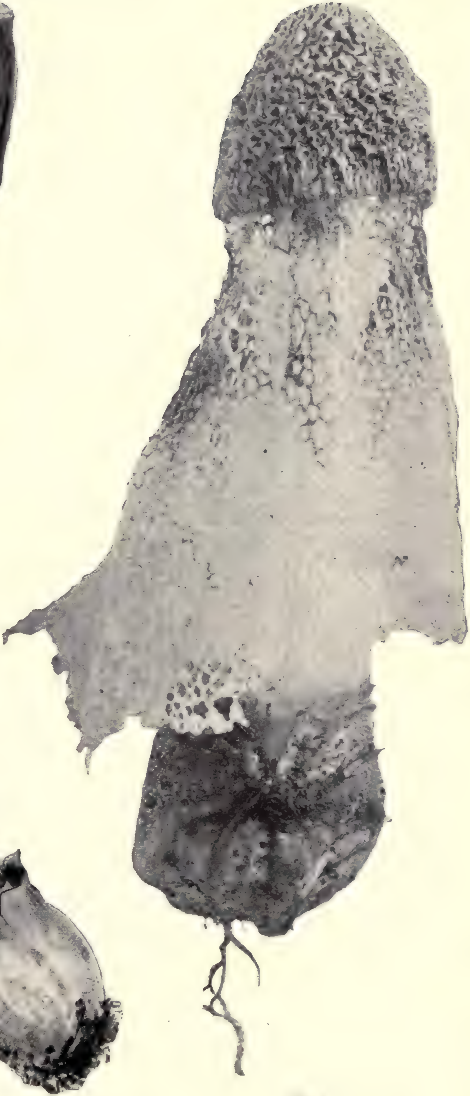

Fig. 1.

PHALLUS INDUSIATUS.

and Brisbane by Bailey. The veil in the Australian plant is white, as far as known, but forms with pink veils occur in other countries and probably also in Australia.

SYNONYMS.—In recent works the plant is often called Dictyophora phalloidea, a name that was invented by Desvaux about the beginning of the last century. In the Handbook it is also called Dictyophora tahitensis and Dictyophora speciosa, names that are merely synonyms and not based on any points of difference. The latter had its origin in a grotesque and impossible figure that was published by Klotzsch.

PHALLUS MERULINUS (Fig. 2).—Pileus narrow, thimble-shaped, with elongated reticulations. Veil, long, white, cylindrical, with large hexagonal meshes, not spreading. Stipe white.

This plant is known only from Australia, a single collection by Bailey from Brisbane.[1] At best it is only a form of the preceding and moreover, a doubtful form. It appears to me that Cooke has given a very good illustration of the Australian form from the dried specimen, but we would be better satisfied if we had a photograph.

PHALLUS MULTICOLOR (Fig. 3).—Pileus narrowly bell-shaped, reticulate, *orange red* color. Veil long with large meshes, *bright lemon-yellow.* Stipe bright, *lemon-yellow.* Volva pink. Mycelium purple.

The type specimen of this plant is in the British Museum. It was collected at Brisbane by Bailey, and the color description is from notes by him taken from the fresh plant. It differs from Phallus indusiatus chiefly in being a *colored* plant. Penzig finds the same species abundantly in Java and gives a good photograph which we reproduce. The color notes of the Javanese plant differ (but not materially) from those given for the Australian plant. The pileus is described as a dark yellow, the veil as bright orange. Penzig photographed, as will be noticed (fig. 3), a double plant. It is an anomaly such as is not infrequent among the phalloids.

PHALLUS CALLICHROUS.—This species is originally from Brazil and has not been figured. It is evidently very close to multicolor, but differs in having a *white* stipe and veil and an *orange* pileus. Similarly colored plants are also known from Java and Africa. Whether or not it will be practicable to maintain species *on the color* of the parts, only time will develop. There is at Kew a specimen

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[1] The name was originally vaguely applied to a plant of Java, of which the type is destroyed and nothing is known. The few indications that exist point to the original being a common plant of Java which is now known as Phallus irpicinus. I think there was little reason at first to so determine this Australian plant, as excellent work has been done in recent years with the Javanese phalloids, and this form is not known in Java. It appears to me that as its meaning has been lost in connection with the Javanese plant there is no harm in adopting the name in the sense in which it has been used for the Australian plant. Professor McGinty writes me that this is strictly "against the rules," and he proposes for the Australian plant the name "Phallus Rochesterensis, McGinty," in remembrance of the village in which these celebrated "rules" were promulgated.

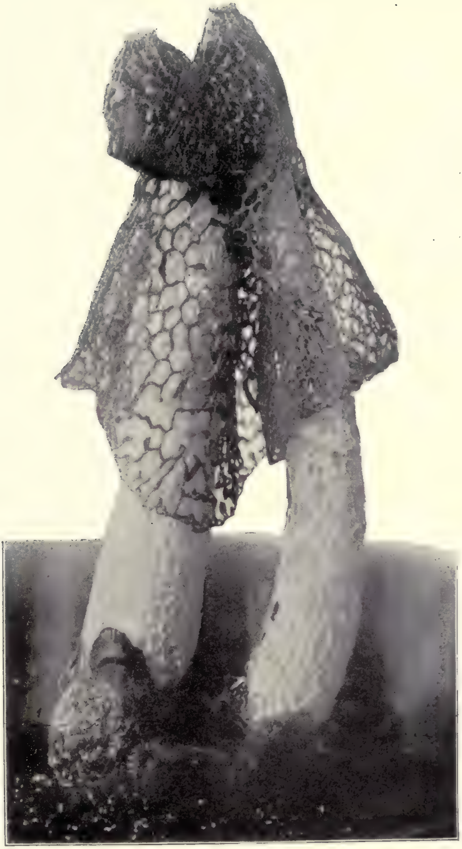

Fig. 3.

PHALLUS MULTICOLOR.

(A double specimen.)

collected at Brisbane by Bailey, and a sketch in which the colors given are the same as those of Phallus callichrous.

Section 2, Veil Short. Ithyphallus of Many Modern Works.

PHALLUS IMPUDICUS (Fig. 4).—Pileus broadly campanulate, reticulate. Veil rudimentary, stem white.

But one collection so referred is known from Australia. It was found by Bailey in some drift rubbish on "Tringelburra Creek, nine hundred miles north of Brisbane." Bailey states he saw only one specimen, and this is the only one that has reached Europe. It therefore seems rare in Australia, which is strange, as it is the most common phalloid of Europe. Our illustration is from the European plant. Bailey's plant seems to be correctly referred, but the dried plant is more yellowish and the pileus more broadly bell-shaped than the European form.

PHALLUS AURANTIACUS.—Pileus thimble-shaped, orange-red, smooth or rugulose when free of gleba. Veil none, or more probably rudimentary. Stipe orange-red.

This plant was originally described from India, if it is really distinct from Phallus rubicundus of the United States. If distinct, I do not know the difference. I have seen no specimens from Australia that are as obese as those from India. All I have seen are the next form.

PHALLUS GRACILIS (Fig 5).—This has all the characters of the preceding excepting it is much more slender. There are several collections at Kew from Australia where it appears to be frequent. It will be readily recognized when fresh by having a red stem and a pileus the substance of which is red. I have also seen specimens from South Africa, China, and Hawaii, and it is undoubtedly widely spread in warm countries.

SYNONYMS.—In Berkeley's herbarium are found specimens from Australia labeled Phallus libidinosus and Cynophallus Cayleyi, but I think neither was published. Phallus novae-hollandiae as figured by Corda is very much the same plant as to stature but was said to have a white stem. Fig. 98 of the Handbook is a reconstructed figure. I have seen a specimen at Geneva so labeled, claimed to be from Corda, which impressed me as being Phallus gracilis. It is hard to state as to the color of the stem, for the color of all old, dried phalloids is very much the same. Phallus vitellinus was "described" by Mueller (Phyt. Aust, 7, 122) but never illustrated. From the "description" I judge it to be this plant. I feel so sure that "Ithyphallus atrominiatus" as named by Bailey as a new species is the same plant, that I use his figure (fig. 5) to illustrate the plant.

Doubtful Species.

Several of the so-called species of Australia are based on single collections and are extremely doubtful. They were published and "illustrated" years ago and nothing additional is known about them. It is due that observers in Australia should furnish specimens, photographs, and notes from which something definite can be known.

PHALLUS CALYPTRATUS (Fig. 6).—This was said to have an orange pileus which bears a portion of the volva as a calyptra. The type from Bailey

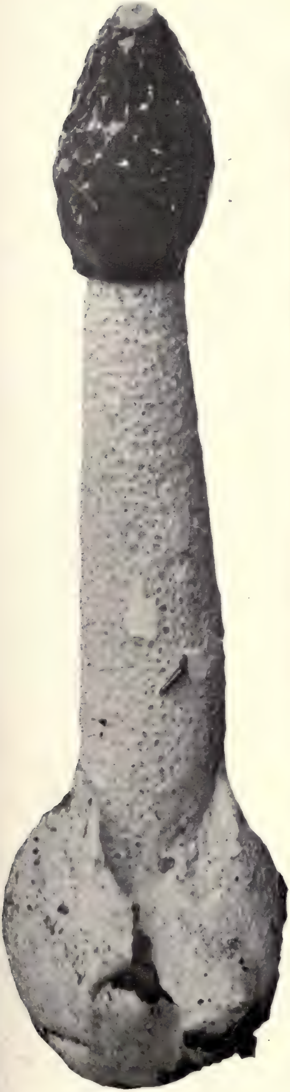

Fig. 4.

PHALLUS IMPUDICUS.

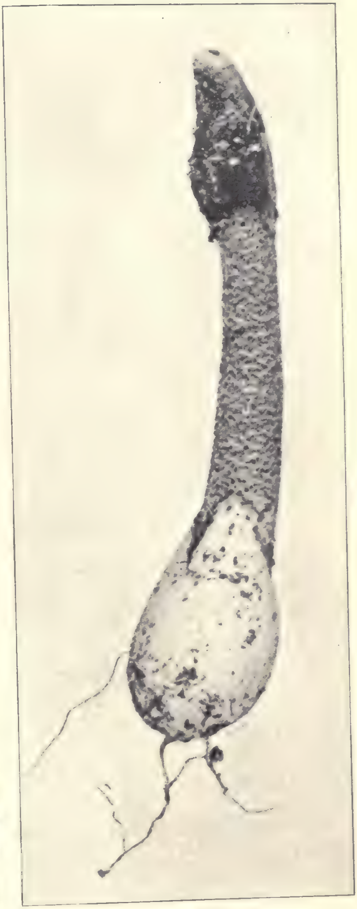

Fig. 5.

PHALLUS GRACILIS.

is in the British Museum. It is not I think a form of aurantiacus as stated, as the pileus is much more strongly reticulate. The "calyptra" appears to me to be a mass of gleba covering the upper part of the pileus and not a portion of the volva as stated. In any event it is surely accidental in this specimen and not a specific character. Only one specimen was collected or is known.

PHALLUS QUADRICOLOR (Fig. 7).—This also is based on a single specimen and a sketch from Bailey, which are now in the British Museum. I have a strong suspicion that it was a specimen of Phallus multicolor that had accidentally lost its veil. It is at least curious that the color notes of the collection are identically the same as to both species: "pileus orange, stipe lemon-yellow, volva white, mycelium purple." When a species of Phallus with a veil accidentally loses its veil (as specimens often do) it becomes in modern nomenclature another genus.

PHALLUS DISCOLOR (Fig. 8).—This is based on a plant from Australia and was illustrated by Kalchbrenner. If it was correctly illustrated it differs from all other phalloids in having a pileus-like apex *adnate at the base* to the top of the stem. It was described as Phallus aurantiacus, var. discolor, and changed by Fischer to "Mutinus? discolor." The doubtful mark was well placed. It is neither a Phallus nor a Mutinus if it is correctly shown. There are, however, many "ifs" to be considered when it comes to Kalchbrenner's work. I doubt much if any such phalloid ever grew.

PHALLUS RETUSUS (Fig. 9).—This is also Kalchbrenner's work, which when figured and described he erected into a new genus Omphalophallus because he states the pileus is imperforate. Fischer, who has examined specimens at Berlin, states this is all Kalchbrenner's imagination (or words to that effect) and that the opening is covered with a fragment of the volva, hence Kalchbrenner did not find it. Fischer also states that Phallus Muellerianus (or rather "Omphalophallus Muelleriana") is the same plant and that both are better referred as an obese form of Phallus aurantiacus. From Kalchbrenner's figure the latter does not seem to me to be possible.

PHALLUS RUBICUNDUS.—An American species has been recorded in Australia. As previously stated I do not know what the exact difference is between this species and Phallus aurantiacus and I suspect they will prove to be the same. Nor have I seen any specimens from Australia as obese as the American form.

THE GENUS MUTINUS.—This genus does not have a separate pileus at the apex of the stem as in the genus Phallus. On the contrary the gleba is borne *directly* on the upper portion of the stem. One species, Mutinus caninus, is common in Europe, but little or nothing is known as to the species in Australia. At Kew there are but two collections.

MUTINUS CURTUS (Fig. 10).—This is based on a single collection made sixty years ago by Drummond. It impresses me as being based on undeveloped plants. A figure was given by Corda (Fig. 10), but I think was largely imaginary, and I can see no warrant for the *lobed* volva as shown in the figure.

MUTINUS PENTAGONUS (Fig. 11).—At Kew there are a couple of specimens in Cooke's herbarium labeled "Mutinus pentagonus, Bailey, Mutinus sulcatus, C. & M." I think it is not "Mutinus

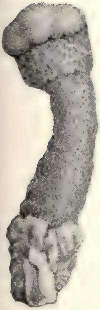

Fig 6.

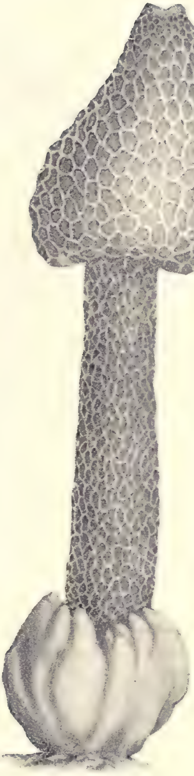

Fig. 7.

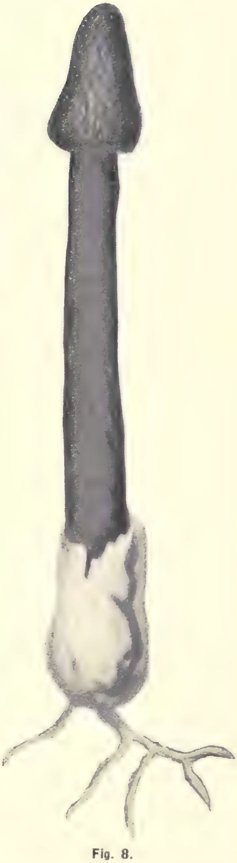

Fig. 8.

Fig. 6. PHALLUS CALYPTRATUS. Fig. 7. PHALLUS QUADRICOLOR.
Fig. 8. PHALLUS DISCOLOR.

sulcatus, C. & M." which has a cylindrical stem and was afterwards recognized by the authors (correctly I think) as being a young condition of Lysurus australiensis. The stem is sulcate, pentagonal, as Bailey well names it, and the gleba portion is also strongly fluted. The gleba does not uniformly surround the upper portion of the stem as in other species of Mutinus, but is borne only along the channels with a free line along the edge. This would indicate that the plant is not a Mutinus, but a young Lysurus, and that in a later state the lobes may open out along these lines. There is such a species of Lysurus in China and Japan (Lysurus Mokusin), and our plant has a close resemblance to the original figure of this species. I have examined the Australian specimens very carefully with a hand glass and the upper portion seems to me to be consolidated in one piece, and I do not believe it ever opens in lobes. However, in case it does then our plant becomes Lysurus Mokusin.

Mr. Bailey has published it as a Mutinus, and as he has observed it growing he would undoubtedly have noticed if it were only the young condition of a Lysurus.[1] He named it Mutinus pentagonus, "referring to the five-angled receptacle." Afterwards he found a specimen with six angles which he called Mutinus pentagonus, var. Hardyi. That was only an individual variation, not of any importance in classification and not worthy of a name, even as a variety.[2]

MUTINUS PAPUASIUS (Fig. 12).—I know the plant only from the figure given by Kalchbrenner, which he drew from specimens sent him by Mueller. There are no specimens either at Kew (or Berlin, I judge from Fischer's work) and it is not really known whether the plant is a Mutinus or a Phallus. If a Mutinus it is the most slender species known.

MUTINUS WATSONI.—Also a very doubtful species "described" from Australia, but no figure or type material exists. It will probably never be known.

MUTINUS (?) ANNULATUS (Fig. 12a).—This plant is only known from a figure (12a) published by F. M. Bailey. But one specimen was found which was lost in transit to Kew. The stipe is white, the gleba-bearing portions "red-ochre" and "annulated." The plant therefore probably belongs to the genus Floccomutinus of Java.[3]

THE GENUS LYSURUS.—This genus has a columnal stem bearing free lobes at its apex. The gleba is borne on these lobes. When young the lobes are connivent, and then the plants may be

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[1] The early stages of Lysurus with the arms connivent have led to some very misleading pictures. Thus Berkeley's original picture of Lysurus Gardneri so misled Professor Fischer that he transferred it to another genus, but after he visited Kew and saw that it misrepresented the plant he should have transferred it back. Our American species Lysurus borealis was named Anthurus borealis, but in my opinion is a Lysurus and I think the same as the Ceylon species. It was originally illustrated with a drawing subject to the same criticism as the original drawing of Lysurus Gardneri.

[2] It is very well established now that the *number* of arms, or lobes, or angles, or columns, is never constant in any species.

[3] Professor McGinty proposes as its name " Floccomutinus annulatus, (Bailey) McGinty."

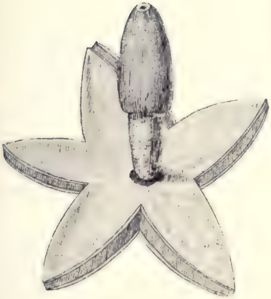

Fig. 10.

Fig. 12.

Fig. 12a.

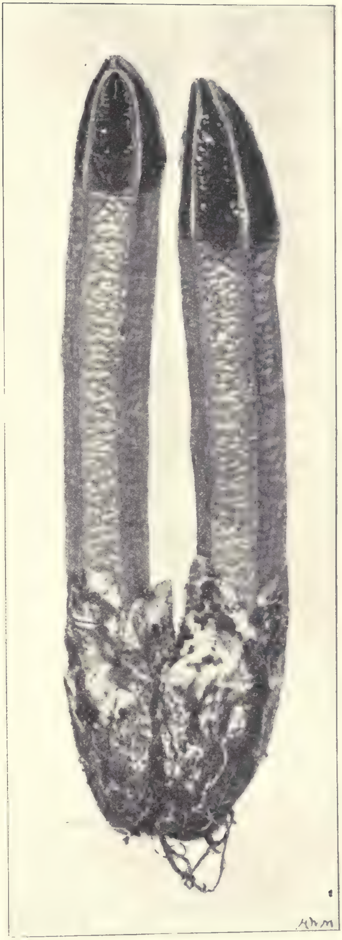

Fig. 11.

FIG. 10. MUTINUS CURTUS.
FIG. 12. MUTINUS PAPUASIUS.

FIG. 11. MUTINUS PENTAGONUS.
FIG. 12a. MUTINUS (?) ANNULATUS.

thought to be Mutinus[2] When old the lobes separate and spread out. The genus is known in Australia by only one abundant collection.

LYSURUS AUSTRALIENSIS (Fig. 13).—Stem white, cylindrical, four to five inches long. It bears at the top usually five somewhat irregular, sulcate, pointed, arm-like lobes. The gleba is borne on these lobes.

History.—Bailey first sent to Cooke a single specimen, which was young with the lobes connivent, and Cooke described it as Mutinus sulcatus. The next year Bailey sent more ample and better developed specimens, which Cooke called Lysurus australiensis. These are the only collections known. Cooke gives a very good figure of it in the Handbook, which we have reproduced (Fig. 13). The lobes of this figure are not as irregular as those of Fig. 13a made from the dried specimen. It is my belief that Lysurus australiensis, as well as Lysurus borealis of the United States, are the same as Lysurus Gardneri,[3] originally from Ceylon. We can note very little difference on comparison of the dried specimens, but we shall not throw them together until we get more evidence on the subject.

THE GENUS ANTHURUS.—The original idea of the genus Anthurus by Kalchbrenner, is a flaring tube, the limb divided into segments. This meaning has been entirely perverted by recent writers and an entirely different definition given to the name. We use the word in its original meaning, for we believe it is not good classification to include with the original species several plants that are now placed in the genus.[4] I have never seen a specimen of a true Anthurus according to Kalchbrenner's distinction.[5]

ANTHURUS MUELLERIANUS (Fig. 14).—This plant was named by Kalchbrenner from specimens received from Baron von Mueller. There are no specimens at London, and I know only Kalchbrenner's figure which was reproduced in Cooke's Handbook. It has a strongly flaring, tubular stem and is described as yellowish-red, but the figure he gives is bright red, which is more probably its color.

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[2] Indeed it is a question if Mutinus pentagonus of this pamphlet is not really a Lysurus.

[3] Lysurus Gardneri, of Ceylon, which was so named and described by Berkeley, is a true Lysurus with spreading arms, and not a "Colus," as found in Fischer's latest work. Fischer referred it to the genus Colus on the strength of Berkeley's figure, and he was justified if one is ever justified in changing classification on the evidence of a figure. When Professor Fischer came to Kew, however, and saw the specimens, he should have receded from his position, for it is quite evident the plant is a Lysurus, and not a Colus in any sense of tne word. The arms are entirely separate and spreading when mature. Like all species of Lysurus, they are connivent when young, but they are not joined at the apex, however slightly.

[4] When it was discovered that the genus Lysurus original species, had the gleba borne on the outer surface (and sides) of the arms, it was assumed that if the gleba is borne on the inner surface and sides the plant belongs to the genus Anthurus. That does not follow reasoning. For us, all plants with a columnar stem and free arms at the apex belong to Lysurus, and if we could not place them with Lysurus we would make a new genus for them. It is an entirely different idea from the genus Anthurus of Kalchbrenner, which consists of plants with a ***flaring tube***, the limb of the tube divided into segments cfr. Fig. 14).

[5] There are at Kew some specimens from South Africa which Kalchbrenner called Anthurus Woodii, but they do not have a flaring tube as Kalchbrenner shows in his cut, and I should class them as Lysurus.

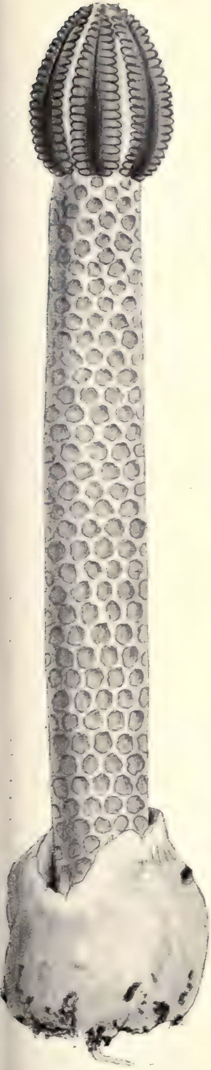

Fig. 13.

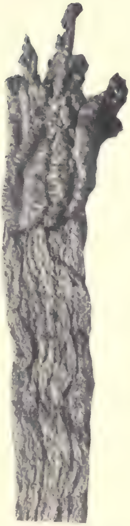

Fig. 13a.

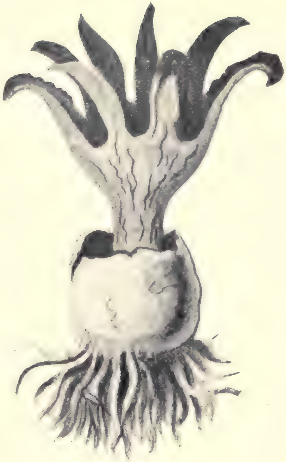

Fig. 14.

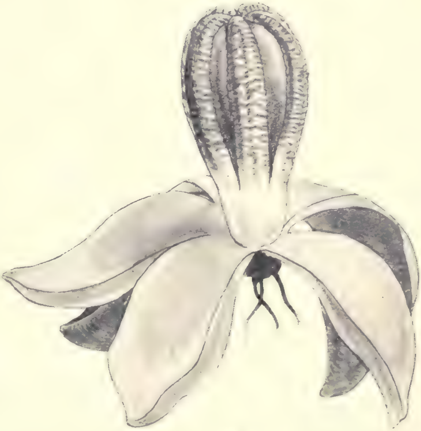

Fig. 15.

Fig. 13. LYSURUS AUSTRALIENSIS. Fig. 14. ANTHURUS MUELLERIANUS. Fig. 15. ANTHURUS (?) ARCHERI.

ANTHURUS ARCHERI (Fig. 15).—This was described by Berkeley in Flora Tasmania as Lysurus Archeri, but on the plate the name is written Lysurus pentactinus. There are no specimens known. Fischer unites the plant with the previous, but I can see no resemblance between the figures and I think no one knows anything about the plants. Anthurus Archeri according to the figure is a very doubtful Anthurus, or Lysurus either as to that. In the sectional drawing the arms are shown to be bifid, and it seems to me the plant inclines towards the genus Aseroe.

THE GENUS ASEROE.[6]—Stem tubular, abruptly spreading into a horizontal limb which is divided into from five to eight or more long segments. Usually the segments are bifid and prolonged into slender points. The color is usually bright red. It is a very common genus in Australia and seems to take many forms so that the species are all doubtful. They have all been thrown together by Professor Fischer into one species, but the various forms as figured seem quite different. However, it is probable that when these forms are well known it will not be practicable to keep them distinct. We present figures of the various forms which tell the story of the variation better than our words can. By observing the plants as they grow, those who live in Australia can soon decide if there is any constant value in these variations.

ASEROE RUBRA (Fig. 16).—This was the original form known and was from Australia.[7] It has short spreading rays. No corresponding plant has since reached Kew, but it is curious to know that adventitious plants, exactly the same as this original form, have come up occasionally in the hothouses at Kew.

ASEROE PENTACTINA (Fig. 17).—The next form from Australia has much longer and narrower rays. It was figured in Endlicher's Icones, Plate 1,[8] and called Aseroe pentactina in reference to the number of rays (which is of no importance as the number varies). Berkeley (1844) illustrated practically the same plant under the name Aseroe rubra, but it had eight rays. Corda reproduced Berkeley's figure and changed the name to Aseroe actinobola. It

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[6] The name Aseroe is generally spelled Aseroë to indicate that the final vowels are pronounced separately. It seems to me a waste of energy. It was originally spelled Aseroe by La Billardière. Fries has it Ascroë which raised a protest from Montagne.

[7] About the beginning of the last century the French government sent out an expedition in search of scientific knowledge under the command of La Pérouse. It came to grief somewhere, and three years later the government sent another expedition in search of La Pérouse. La Billardière was the botanist of this second company. He found Aseroe in "Cape Van Diemen," and was so impressed with it that he published a figure. It was the only fungus that he collected on the voyage. He called it Aseroe from the "disposition of its rays." Montagne corrects the spelling to Aseroë, stating that it was from a Greek word meaning nauseous. He seems to have known more about the origin of the name than the namer. Montagne's corrected spelling has since been generally used.

[8] The reference is often also given "Endlicher Atakta, Plate 50." This is an error, for the work contains only forty plates, and no fungi at all.

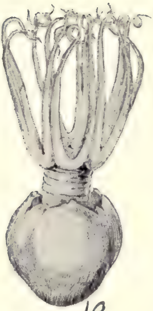

Fig. ~~16~~ 19

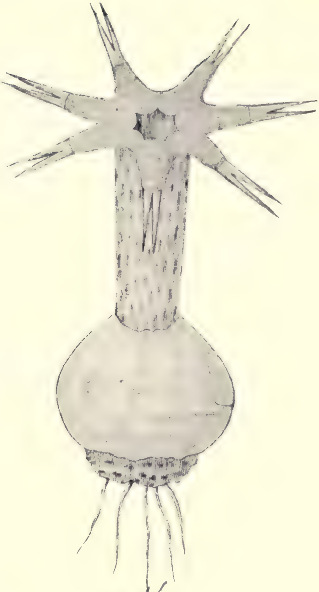

Fig. ~~19~~ 16

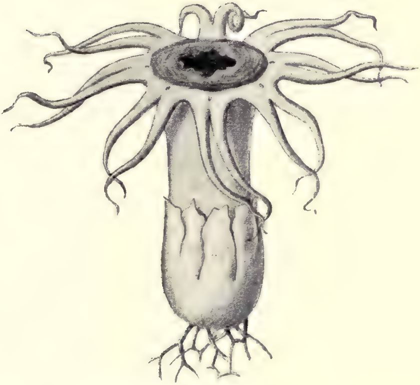

Fig. 17

Fig. 16. ASEROE RUBRA. Fig. 17. ASEROE PENTACTINA.
Fig. 19. ASEROE HOOKERI.

seems to me the same form as Endlicher's plant. Judging from the specimens that have reached Europe, this form with the long, narrow rays is the most frequent form in Australia.

ASEROE MUELLERIANA (Fig. 18).—Kalchbrenner illustrated under the name Aseroe rubra a form with a broad limb. Fischer first changed it to Aseroe rubra var. Muelleriana, and afterwards referred it to Aseroe Junghuhnii of Java. The latter, according to the figures and description is a much larger and quite differently shaped plant. I have seen no specimen corresponding to Kalchbrenner's figure.

ASEROE HOOKERI (Fig. 19).—A very small form with very narrow rays reached Hooker from Dr. Sinclair, New Zealand. Berkeley called it at first Aseroe viridis under the impression that when fresh its color was greenish. Afterward when he became convinced that he had been mistaken as to its color he re-named it Aseroe Hookeri.[9] It is the smallest form described and appears quite different from the other forms usually received from Australia.

ASEROE LYSUROIDES.—Corda bases a figure on a specimen which he saw in Delessert's herbarium[10] and called it Lysurus aseroeformis, which Fischer changed to Aseroe lysuroides.[11] I am so well satisfied that Corda's figure, young, (with gleba surrounding the arms) is not the same as his expanded figure (surely an Aseroe) that I reproduce neither. The plant is shown as having a very long, slender stem and short, broad rays.

THE GENUS LATERNEA.—This genus has columns, usually three to five, which are *united at the top*. It is a common genus in Southern United States, West Indies and South America, but its occurrence in Australia is not assured. In the Handbook (and most recent books) the genus Laternea is united to Clathrus, but for me there exist no more distinct genera among the phalloids.

LATERNEA COLUMNATA (Fig. 20).—The record of this genus in Australia is based on a specimen from T. Kirk to Cooke and determined as Laternea triscapa. If it is a Laternea it is much too obese to be L. triscapa and is probably Laternea columnata. The specimen is so broken and twisted and imperfect that I am not at all sure even that it belongs to the genus Laternea.

THE GENUS PSEUDOCOLUS.—This genus as I conceive it can be described in a few words as being a Laternea on a stalk. It

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[9] I am informed by Professor McGinty that this was absolutely contrary to the rules. If Berkeley called the plant "green," it must be "green," and neither Berkeley nor any one else, "according to the rules," can change its name. In nomenclature "rules" seem to be much more important than facts.

[10] Now at Geneva. I did not look up the specimen when I was there.

[11] It becomes now "Aseroe aseroeformis, McGinty," according to his "rules.

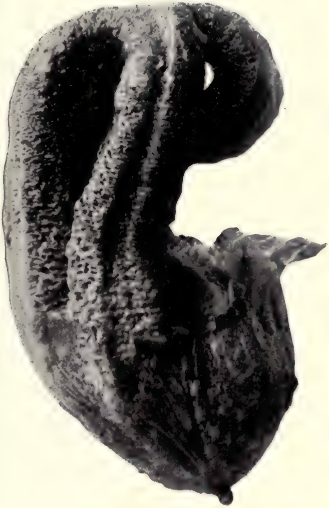

Fig. 20.

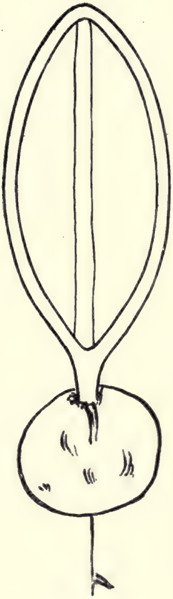

Fig. 21.

FIG. 20. LATERNEA COLUMNATA.

FIG. 21. PSEUDOCOLUS ROTHAE.
(Merely a crude sketch.)

consists of columns (three always, as far as I know) which are united at the top, and into a stem at the base. Usually these plants have been included in the genus Colus, but the original of that genus is for me a very different plant with the receptacle truly *clathrate*.

PSEUDOCOLUS ROTHAE (Fig. 21).—There are at Kew two collections of this plant. One from Miss Carter, Moonan Brook, N. S. W., and the other from Bailey, Brisbane. The former has the arm broken and was referred by Professor Fischer (2d Unters., p. 23) to Colus Muelleri. The latter is more perfect and is accompanied by a sketch from Bailey from which our figure has been made. It was called by Professor Fischer (l. c.) Colus Rothae, but he considered it a doubtful form of Colus Muelleri and omits it from his latest work. If Kalchbrenner who described and figured Anthurus Muellerianus gave a correct figure of it (and his figure is all that is known, see Fig. 14) it is a true Anthurus with free lobes and has no relation or resemblance to this plant. Bailey sent with his sketch the following notes: "Divisions of the receptacle always three, arched, *and joined at the apex.* Of a rich orange, and obtusely triangular, porous-celled. The entire portion (stipe) very short or not extending beyond the volva." There grows in Java a very similar species, but more robust and with the arms strongly convolute, crenate on the inner sides. There is a nice drawing of it at Kew, made by Zollinger many years ago. It has never received a name unless perhaps "Laternea ? pentactina," Monsunia p. 23, refers to it, but it is surely not the same as Berkeley's plant under this name.

THE GENUS CLATHRUS.—This genus is well known in Europe, where the original species, Clathrus cancellatus, is a very celebrated plant. The genus has a receptacle which is "clathrate" or consists of lattice work. The two common species of Australasia belong in fact to a different genus called Ileodictyon and their structure is well known. We do not maintain the genus Ileodictyon because there are so many other species that can not be told whether they are Clathrus or Ileodictyon from the material in the museums. The structure of the arms of the genus Clathrus is *cellular;* that of Ileodictyon is ***tubular***.

CLATHRUS CIBARIUS (Fig. 22).—This is a very common species in New Zealand. It is rare in Australia and we know of but two collections from Australia. It is a large plant we judge, four or five inches in diameter when fully expanded. The width of the flattened branches is a centimeter or more. When we published our plate (91) we knew of no photograph of a fresh plant, but have since found a photograph in the Economic Museum at Kew. It was made by a Mr. Clarke and represents a number of plants. Our cut (Fig. 22) is from this photograph, and we do not know how much it has been reduced. Clathrus cibarius appears to be very com-

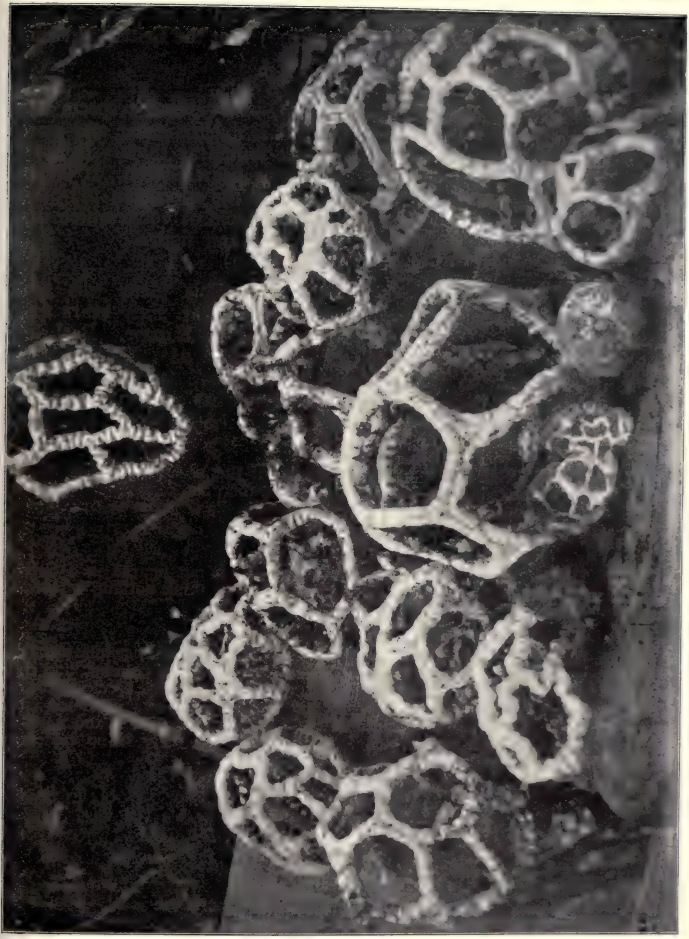

Fig. 22,

CLATHRUS CIBARIUS.

(Reduced probably more than half.)

mon in New Zealand and rare in Australia, and it is not confined to Australasia. It occurs in Chile and is reported from South Africa and a curious form (cfr. Myc. Notes, p. 296) is at the British Museum from Brazil.

CLATHRUS GRACILIS (Fig. 23).—In general respects this is very much like the preceding plant, but is much smaller and more slender and the arms are only about one-fourth as thick. It is an Australian species and numerous specimens are at Kew. It is not known from New Zealand. Berkeley named the species in 1845 and gave what appears to be a good figure but devoid of volva which was wanting in the original specimens, as it is in our figure.

CLATHRUS PUSILLUS (Fig. 24).—This plant was sent abundantly to Berkeley by Drummond, Swan River, sixty years ago. There has been no other collection received in Europe. Berkeley gave what seems to be a good picture of it (Fig. 24). The color is bright red. The arms are slender, forming above an isometric network, but below they are disposed in a somewhat columnar manner. The type specimens are in good condition in the herbarium at Kew.

CLATHRUS CRISPUS.—This is a species of the West Indies and South America. It is included in the Handbook as Australian but I know not on what ground as there are no specimens at Kew from Australia that can be so referred nor any so determined.

CLATHRUS ALBIDUS.—This was described but not figured in a Swiss publication about thirty years ago (from Australia). I think nothing whatever is known about it.

THE GENUS COLUS (Fig. 25).—This is a peculiar genus of the Mediterranean regions. The receptacle is clathrate, borne on columns and the columns are united at the base into a stalk. There is but one species known, Colus hirudinosus, which is peculiar in its habits among the phalloids. It grows only *on manure*. It is included in the Australian Handbook and a good figure given of it (as it was copied from Tulasne) but there is no evidence of any similar plant known from Australia.

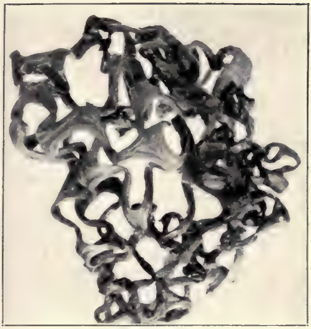

Fig. 23.

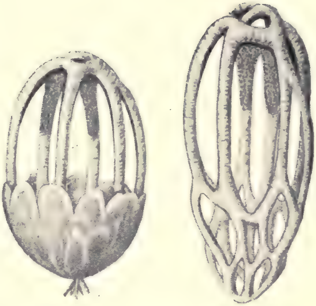

Fig. 24

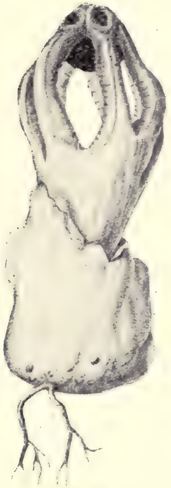

Fig. 25

Fig. 23. CLATHRUS GRACILIS. Fig. 24. CLATHRUS PUSILLUS.
Fig. 25. COLUS HIRUDINOSUS.

SOURCE OF THE CUTS REPRODUCED IN THE PRECEDING PAGES.

Fig. 1, From photograph made in Samoa.
Fig. 2, From Cooke's Handbook.
Fig. 3, From photograph by Penzig, Java.
Fig. 4, From photograph made in France.
Fig. 5, Original by F. M. Bailey.
Fig. 6, Original by Berkeley.
Fig. 7, Original by Berkeley.
Fig. 8, Original by Kalchbrenner.
Fig. 10, Original by Corda.
Fig. 11, Original by F. M. Bailey.
Fig. 12, Original by Kalchbrenner.
Fig. 12a, Original by F. M. Bailey.
Fig. 13, From Cooke's Handbook.
Fig. 13a, Photograph of dried specimen at Kew.
Fig. 14, Original by Kalchbrenner.
Fig. 15, Original by Berkeley.
Fig. 16, Original by Corda (after La Billardière).
Fig. 17, Original from Berkeley.
Fig. 19, Original from Berkeley.
Fig. 20, Photograph from plants from Florida.
Fig. 21, Crude sketch copied from Bailey.
Fig. 22, From photograph in the museum at Kew.
Fig. 23, From an alcoholic specimen.
Fig. 24, Original by Corda.
Fig. 25, Original by Tulasne.

NOTE.—Some of these figures which were originally as stated above we have taken from the copy in Engler and Prantl, or as copied in Corda.

Figs. 9 and 18 (as originally intended) are omitted from the pamphlet, as we did not succeed in obtaining in America a copy of the pamphlet from which we had intended to reproduce them.

Fig. 24, Clathrus pusillus, is from Engler and Prantl, originally by Corda. Berkeley's figure that we had intended to reproduce is a better representation of the plant.

PUFF BALL LETTER NO. 4.

Cincinnati, May, 1905.

The following persons have kindly sent us specimens since our last acknowledgment, and will be continued on the mailing list of Mycological Notes. This publication is issued principally with the object of interesting collectors in picking up specimens and sending them to our museum, and we can not promise to continue to send to those who do not take this much interest in the subject.

We have made what we feel is a very thorough study of the "puff ball" families, not only of the United States, but of the world as far as known. We have seen and studied all the specimens that are preserved in the principal museums, which embrace practically all that are described. The genus Tylostoma has not been worked up, but otherwise we feel familiar with practically all the known species. Outside of these families, however, we claim to have no critical knowledge, only a general knowledge of the current names of the common species. We list the specimens received that we know under these names. Others, when we do not know the species, are listed under the genus only.

We are glad to get material of any fungus of a *firm nature* that retains its characters when dried (see circular enclosed). C. G. LLOYD.

LIST OF SPECIMENS RECEIVED FROM THE UNITED STATES AND CANADA SINCE LAST REPORT (JULY, 1904).

E. K. Abbott, Salinas, Cal.:—Calvatia occidentalis (note 1), Geaster hygrometricus.

W. H. Aiken, Knoxville, Tenn.:—Arachnion album.

S. M. Bain, Knoxville, Tenn.:—Lycoperdon gemmatum.

C. H. Baker, Verona, Pa.:—Geaster hygrometricus, Scleroderma aurantium, Cyathus.

C. H. Baker, Grasmere, Fla.:—Lycoperdon piriforme.

J. M. Bates, Red Cloud, Neb.:—Lycoperdon tessellatum.

A. S. Bertolet, Canada:—Hydnum, Polystictus, Polyporus.

A. S. Bertolet, Fairhope, Ala.:—Tuckahoe (note 2).

Hugo Bilgram, Philadelphia, Pa.:—Lycoperdon fuscum, Lycoperdon subincarnatum, Scleroderma tenerum, Geaster velutinus.

Mrs. E. B. Blackford, Boston, Mass.:—Bovista plumbea, Scleroderma tenerum, Lycoperdon dermoxanthum, Lycoperdon cruciatum, Boletus parasiticus, Hydnum aurantiacum, Hydnum adustum.

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F. H. Blodgett, College Park, Md.:—Mitremyces lutescens.

E. E. Bogue, Agricultural College, Mich.:—Lycoperdon piriforme, Lycoperdon serotinum, Cyathus vernicosus.

E. E. Bogue, Lansing, Mich.:—Geaster hygrometricus.

Fred J. Braendle, Washington, D. C.:—Lycogala flavofuscum, Lycoperdon acuminatum, Lycoperdon subincarnatum, Clavaria pistillaris, Rhizopogon, Thelephora cladonia (?) Thelephora caryophyllea, Thelephora, Discina reticulata, Urnula craterium, Cortinarius Braendlei, (co. type,) Gyromitra curtipes, Phallus imperialis.

Chas. E. Brown, Milwaukee, Wis.:—Polystictus pergameus, Polystictus abietinus, Polyporus adustus, Polyporus brumale, Polyporus versicolor, Merulius tremulosus, Favolus europaeus, Daedalea confragosa, Daedalea unicolor, Panus rudis, Stereum versicolor, Stereum complicatum (?), Lenzites betulina, Irpex sinuosa, Hypomyces lactifluorum, Xylaria polymorphum.

E. V. Burke, San Francisco, Cal.:—Helvella Californica (a fine collection).

L. W. Carter, Peno, S. D.:—Catastoma subterranea, Cyathus stercoreus, Mycenastrum Corium, Calvatia lilacina.

J. F. Clark, Fairfield, Iowa:—Scleroderma tenerum, Scleroderma aurantium, Bovistella Ohiensis (?), Calvatia lilacina, Cyathus striatus, Daldinia concentrica, Lycoperdon cruciatum, Lycoperdon gemmatum, Lycoperdon, Xylaria, Lycogala epidendrum.

W. N. Clute, Binghamton, N. Y.:—Polyporus gilvus, Trametes rubescens, Polystictus pergameus, Fomes leucophaeus, Fomes ignarius, Fomes fomentarius, Daedalea unicolor, Daedalea quercina, Irpex lacteus, Lycoperdon Wrightii, Lenzites sepiaria.

C. S. Conkling, Antwerp, N. Y.:—Lycoperdon piriforme, Lycoperdon muscorum, Lycoperdon compressum, Lycoperdon gemmatum, Lycoperdon serotinum, Lycoperdon atropurpureum, Scleroderma aurantium.

S. Crosby, Cambridge, Mass.:—Lycoperdon pusillum, Lycoperdon cruciatum, Lycoperdon gemmatum, Lycoperdon piriforme, Lycoperdon Wrightii, Scleroderma tenerum, Bovista plumbea (oval), Calvatia lilacina.

Mrs. G. M. Dallas, Philadelphia, Pa.:—Spathularia flavida, Xylaria polymorpha, Ciboria echinophylla, Daldinia vernicosa, Thelephora, Thelephora, Cyphella (?), Lycoperdon piriforme.

Mrs. Geo. M. Dallas, Mt. Pocono, Penn.:—Cyclomyces Greenii.

Simon Davis, Falmouth, Mass.:—Scleroderma Cepa, Scleroderma tenerum, Bovista plumbea, Geaster hygrometricus, Lycoperdon gemmatum, Lycoperdon umbrinum, Lycoperdon Wrightii.

Simon Davis, Stow, Mass.:—Mitremyces cinnabarinus.

Dr. N. S. Davis, Mississippi:—Daedalea unicolor.

R. H. Denniston, Madison, Wis.:—Lycoperdon gemmatum, Lycoperdon, Lycoperdon, Lycoperdon gemmatum, Lycoperdon atropurpureum, Lycoperdon umbrinum, Lycoperdon pulcherrimum, Lycoperdon Wrightii, Geaster rufescens, Scleroderma Cepa, Scleroderma tenerum, Scleroderma flavidum, Bovista plumbea, Bovista pila, Boletus sphaerosporus, Mycenastrum Corium, Phychogaster, Tylostoma.

B. M. Duggar, Columbia, Mo.:—Lycoperdon piriforme, Lycoperdon gemmatum, Geaster rufescens, Geaster hygrometricus, Bovistella Ohiensis, Secotium acuminatum.

H. Dupret, Montreal, Can.:—Xylaria.

Miss Alice Eastwood, San Francisco, Cal.:—Bovista plumbea, Lycoperdon gemmatum, Lycoperdon cepaeforme, Calvatia occidentalis (note 1), Calvatia hesperia (?) Calvatia caelata, Calvatia lilacina (sterile base), Scleroderma Cepa.

E. M. Ehrhorn, Mountain View, Cal.:—Bovista plumbea.

Edw. P. Ely, Monticello, Minn.:—Bovista pila, Lycoperdon, Lycoperdon Wrightii, Lycoperdon gemmatum, Peziza with sclerotium.

Edw. P. Ely, Quincy, Cal.:—Lycoperdon, n. s., Lycoperdon, n. s., Lycoperdon, n. s. Lycoperdon, Lycoperdon piriforme, Crucibulum vulgare (form), Crucibulum vulgare, Trichaster subterraneus (type), Bovista plumbea. Peziza.

Walter H. Evans, Washington, D. C.:—Mitremyces lutescens.

C. E. Fairman, Lyndonville, N. Y.:—Hydnum spongiosipes.

O. E. Fischer, Detroit, Mich.:—Lentodium squamulosum (note 3), Tylostoma campestre, Scleroderma Cepa.

Miss Mary Fitzgerald, Waynesville, N. C.:—Xylaria, Helvella, Leotia, Lycogala epidendrum, Cyathus stercoreus, Scleroderma aurantium, Scleroderma verrucosum, Crucibulum vulgare, Peziza aeruginosa, Peziza, Thelephora sebacea, Thelephora Schweinitzii, Mitremyces cinnabarinus, Auricularia auricula-Judae, Clavaria pistillaris, Bovista pila, Bovista minor, Hydnum, Rhizopogon rubescens, Lycoperdon gemmatum, Lycoperdon piriforme.

James Fletcher, Grand Fork, Can.:—Mycenastrum Corium.

James Fletcher, Ottawa, Can.:—Geaster triplex.

James Fowler, Battersea, Ont.:—Bovista pila.

R. R. Gates, Middleton, N. S.:—Lycogala epidendrum, Lycoperdon gemmatum.

N. M. Glatfelter, St. Louis, Mo.:—Geaster velutinus, Bovistella Ohiensis.

L. A. Greata, Edge of Colorado Desert:—Montagnites (note 4).

M. E. Hard, Chillicothe, Ohio:—Scleroderma Cepa, Scleroderma Geaster (?) Polysaccum pisocarpium, Urnula Craterium, Bovista pila, Bovista plumbea, Polyporus arcularius, Collybia dryophilla.

C. C. Hanmer, East Hartford, Conn.:—Lycoperdon Turneri, Urnula craterium.

G. U. Hay, St. John, N. B.:—Lycogala epidendrum, Scorias spongiosa.

Geo. G. Hedgcock, St. Louis, Mo.:—Geaster rufescens, Tylostoma.

A. J. Hill, New Westminster, B. C.:—Granularia piriforme.

Miss E. Hodges, Pocono, Pa.:—Lycoperdon gemmatum, Lycoperdon excoriatum, Lycoperdon umbrinum, Cyathus striatus.

Wm. Holden, Cincinnati, Ohio:—Morchella conica.

Clara A. Hunt, St. Helena, Cal.:—Lycoperdon subpratense (?), Geaster giganteus, Lycoperdon piriforme, Lycoperdon gemmatum, Scleroderma Cepa?

David L. James, Loveland, Ohio:—Xylaria.

David L. James, White Sulphur Springs, W. Va.:—Geaster hygrometricus, Morchella, Bovista pila, Fomes leucophaeus, Polystictus cinnabarinus.

Joliet (Ill.) High School:—Lycoperdon pulcherrimum, Lycoperdon gemmatum, Lycoperdon piriforme, Polyporus adustus, Polyporus picipes, Polyporus resinosus, Polyporus brumale, Polyporus sulphureum, Bovista plumbea, Xylaria polymorphum, Lycogala epidendrum, Favolus europaeus, Boletinus porosus, Fomes rimosus, Fomes leucophaeus, Polyporus lucidus, Polystictus cinnabarinus, Polystictus pergameus.

W. A. Kellerman, Cedar Point, Ohio:—Geaster saccatus, Tylostoma.

Harlan P. Kelsey, Kawana, N. C.:—Scleroderma aurantium, Bovista pila.

P. B. Kennedy, Reno, Nev.:—Polyporus, Boletus.

Ernest Knoebel, Denver, Colo.:—Secotium acuminatum.

W. T. Lakin, Leitersburg, Md.:—Cyathus vernicosus, Polyporus lucidus, Polyporus elegans (?), Lycoperdon gemmatum, Peziza occidentalis, Lycogala epidendrum, Crucibulum vulgare.

Thos. Langton, Toronto:—Geaster triplex, Geaster limbatus, Lycoperdon gemmatum.

Miss Rose H. Lane, Monterey, Cal.:—Cyathus vernicosus.

E. A. Lehman, Winston-Salem, N. C.:—Polyporus obtusus, Polyporus intybaceus, Polyporus sulphureus, Polyporus Berkeleyi, Polyporus, Polyporus, Polystictus versicolor, Pleurotus sapidus, Fomes Curtisii, Hydnum, Hydnum adustum, Lenzites, velutina, Lycoperdon cruciatum, Geaster saccatus.

Rev. P. Lemay, St. Phillipe de Nere, Que.:—Bovista pila, Lycoperdon gemmatum, Lycoperdon subincarnatum, Lycoperdon fuscum, Lycoperdon, Lycoperdon, Bovistella pedicellatum.

E. D. Lordley, Chester, N. S.:—Calvatia lilacina (dark form), Bovista pila, Lycoperdon.

Milwaukee Museum, Milwaukee, Wis.:—Bovista plumbea (oval spored form), Secotium acuminatum, Geaster saccatus.

E. R. Memminger, Flat Rock, N. C.:—Scleroderma tenerum, Pyrenomycetes.

Chas. McIlvaine, Cambridge, Md.:—Pleurotus nidulans.

John MacSwain, Charlottetown, P. E. I.:—Scleroderma Cepa, Polyporus, Peziza, Helvella, Fomes.

R. B. Mackintosh, Peabody, Mass.:—Scleroderma Cepa? (Thin!!!), Scleroderma tenerum, Scleroderma aurantium, Geaster Schmidelii, Hydnum aurantiacum, Trametes rubescens, Lycoperdon cruciatum, Boletus parasiticus.

W. S. Moffatt, Chicago, Ill.:—Bovista pila, Geaster triplex, Lycoperdon Wrightii, Tylostoma campestre, Scleroderma tenerum.

C. E. Montgomery, Portsmouth, N. H.:—Cyathus stercoreus.

Willard Moore, McConnellsville, Ohio:—Lycoperdon piriforme, Lycoperdon Curtisii, Lycoperdon gemmatum, Lycoperdon Turneri, Lycoperdon, Lycoperdon Wrightii, Secotium acuminatum, Calvatia lilacina, Calvatia craniiformis.

Wm. L. Moore, Pilot Point, Tex.:—Lepiota Morganii.

Mrs. M. A. Noble, Lake Helen, Fla.:—Geaster arenarius, Geaster hygrometricus, Tylostoma, Scleroderma Geaster.

Mrs. M. A. Noble, Linville Mountain, N. C.:—Cyathus striatus, Xylaria.

J. J. Newbaker, Steelton, Pa.:—Amanita muscaria, Lycoperdon gemmatum.

C. R. Orcutt, California:—Fuligo septica (?), Lycoperdon pusillum, Polyporus volvatus.

S. B. Parrish, San Bernardino, Cal.:—Galera, Cyathus vernicosus, Catastoma subterraneum, Bovistella dealbata, Tylostoma, Lycoperdon pusillum, Geaster floriformus, Scleroderma Cepa, Scleroderma venosum (note 5).

Hugo A. Pauly, Cedarburg, Wis.:—Bovista pila, Clavaria pistillaris, Geaster rufescens, Geaster minimus.

Mrs. M. S. Percival, Rugby, Tenn.:—Mitremyces lutescens, Mitremyces Ravenelii.

C. E. Pleas, Chipley, Fla.:—Tylostoma.

Chas. C. Plitt, Baltimore, Md.:—Schizostoma commune, Daedalea confragosa, Daedalea quercina, Fomes lucidus, Fomes leucophaeus, Polyporus picipes, Polyporus resinosus, Polyporus adustus, Polyporus dichrous, Polyporus gilvus, Lenzites betulina (note 6), Lenzites betulina, Polystictus hirsutus, Polystictus versicolor, Polystictus pergameus, Stereum versicolor, Stereum complicatum, Hymenochaeta corrugata (?).

F. R. Rathbun, Auburn, N. Y.:—Amanita solitarius, Lactarius indigo, Lactarius vellereus, Lactarius volemus, Lactarius hygrophoides, Psalliota placomyces.

P. L. Ricker, Lake Simcoe, Ont.:—Fomes carneus, Fomes leucophaeus, Lenzites sepiaria, Stereum, Scleroderma aurantium, Trametes, Trametes, Trametes trabea, Polystictus perennis, Polystictus pergameus, Polystictus versicolor, Polystictus, Polystictus hirsutus, Polystictus cinnabarinus, Polyporus, Polyporus elegans, Polyporus, Daedalea unicolor, Favolus europaeus, Schizophyllum communis.

P. L. Ricker, Florida:—Stereum lobatum.

P. L. Ricker, Orono, Maine:—Pleurotus applicatus, Pleurotus nidulans, Polystictus radiatus, Schizophyllum commune, Daedalea unicolor, Poria subacida, Marasmius rotula.

P. L. Ricker, Maryland:—Polyporus arcularius, Polystictus hirsutus, Irpex sinuosus.

P. L. Ricker, Washington, D. C.:—Lycoperdon gemmatum, Lycoperdon piriforme, Bovista pila (from Piper, Washington).

J. Schneck, Mt. Carmel, Ill.:—Lentodium squamosum (note 3).

S. L. Schumo, Philadelphia, Pa.:—Phalloid egg.

S. L. Schumo, Adirondacks, N. Y.:—Bovista pila, Bovista plumbea, Lycoperdon piriforme, Lycoperdon subincarnatum.

C. L. Shear, Garland, Colo.:—Catastoma nigrescens (type).

C. L. Shear, Washington, D. C.:—Cyathus.

T. L. Smith, Worcester, Mass.:—Lycoperdon piriforme, Lycoperdon cruciatum, Scleroderma aurantium, Mitremyces cinnabarinus, Geaster hygrometricus.

T. L. Smith, E. Madison, N. H.:—Lycoperdon subincarnatum, Lycoperdon cruciatum, Lycoperdon excoriatum, Lycoperdon piriforme, Lycoperdon compressum, Lycoperdon atropurpureum, Lycoperdon gemmatum, Lycoperdon nigrescens, Lycoperdon umbrinum, Calvatia elata.

NOTE.—These specimens were in a box that had enclosed the card of Miss Alice Theobald, Madison, N. H., and were supposed to have been received from her. They are so acknowledged in Mycological Notes, No. 20. They were collected by Theodate L. Smith, Worcester, Mass., who has advised us of the error in a letter from Berlin.

H. N. Starnes, Experiment, Ga.:—Crucibulum vulgare.

E. B. Sterling, Trenton, N. J.:—Urnula craterium, Peziza, Scleroderma tenerum, Scleroderma Cepa, Lycoperdon cruciatum, Lycogala flavo-fuscum, Coprinus arenatus (co-type).
E. B. Sterling, Denver, Colo.:—Geaster minimus, Geaster striatulus, Geaster Schmidelii, Lycoperdon Wrightii.

Prof. F. L. Stevens, Raleigh, N. C.:—Strobilomyces Strobilaceus, Scleroderma tenerum.

J. W. Stiles, Huntsville, Texas:—Lycoperdon cruciatum, Lycoperdon Wrightii (very ?), Bovistella Ohiensis, Polysaccum crassipes, New genus close to Arachnion, Cyathus stercoreus, Calvatia lilacina.

Mrs. Hannah Streeter, Philadelphia, Pa.:—Geaster minimus, Lycoperdon.

Miss Sutliff, Pacific Grove, Cal.:—Rhizopogon.

Mrs. Blanche Trask, Catalina Island, Cal.:—Geaster minimus, Geaster floriformis, Catastoma subterraneum, Catastoma circumscissum, Bovista plumbea, Calvatia lilacina, Calvatia pachyderma, Tylostoma.

Mrs. Blanche Trask, San Jacinto Mountains, Cal.:—Polysaccum crassipes, Calvatia occidentalis, Montagnites (note 4), Lycoperdon (note 7), Geaster hygrometricus, Catastoma subterraneum.

Dr. H. L. True, McConnellsville, Ohio:—Hydnum septentrionale, Polyporus Pilotae, Polyporus picipes, Polyporus sulphureum, Secotium acuminatum Volvaria umbonate.

A. L. Voigt, Detroit, Mich.:—Lycoperdon gemmatum, Lycoperdon rimulatum, Lycoperdon, atropurpureum, Lycoperdon, Scleroderma aurantium, Scleroderma Cepa, Urnula Craterium.

Fred K. Vreeland, Hickory Gap, N. C.:—Bovistella Ohiensis, Geaster hygrometricus, Mitremyces lutescens, Lycoperdon piriforme.

Fred K. Vreeland, New Orange, N. J.:—Lycoperdon gemmatum, Bovista pila.

F. K. Vreeland, Smithfield, Va.:—Calvatia craniiformis.

L. R. Waldron, Towner, N. D.:—Tylostoma, Catastoma subterraneum.

Miss I. M. Walker, Lake of Bays, Ont.—Lycoperdon gemmatum, Bovista pila, Lycoperdon cruciatum

Miss I. M. Walker, Hamilton, Ont.:—Geaster saccatus, Lycogala epidendrum, Bovista plumbea, Peziza, Lycoperdon cruciatum.

Miss I. M. Walker, Lake St. John, Ont.:—Bovista plumbea (oval spores), Bovista pila, Favolus europaeus, Lentinus lepidaeus, Lycoperdon piriforme, Lycoperdon atropurpureum, Lycoperdon umbrinum, Lycoperdon Turneri, Xylaria polymorphum, Scleroderma tenerum.

H. E. Warner, Washington, D. C.:—Lentodium squamulosum (note 3).

Mary S. Whetstone, obtained from Japanese Department of Forestry:—Pleurotus Bretschneideri (Peck Det.).

Mary S. Whetstone, Minneapolis, Minn.:—Lentodium squamulosum (note 3), Lentinus obconicus (*co-type*).

T. N. Willing, Regina, Assiniboia:—Mycenastrum Corium, Lycoperdon pusillum, Lycoperdon, Lycoperdon gemmatum, Cyathus, Cyathus, Calvatia caelata, Geaster rufescens.

Mrs. Daisy F. Wolfert, Toledo, Ohio:—Scleroderma Cepa.

NOTE 1.—There grows in our western states a little globose form of Calvatia lilacina, devoid of sterile base. Vittadini's figure of Calvatia fragilis shows a very scanty sterile base but the plants I have seen from Europe all approximate the usual form of Calvatia lilacina. When we publish the genus Calvatia, whether we shall accept this name occidentalis for our western plant or use Vittadini's name, we have not fully decided.

NOTE 2.—"Tuckahoe" is a mysterious growth that occurs underground, and mostly attached to hickory roots in our southern states. It has been called Sclerotium Cocos and Pachyma Cocos (cfr. Saccardo, 8-908). It has been claimed that it is the sclerotium of a polyporus, but no one ever found a polyporus growing from it. It is also said to be an exudation from the host root which seems to me to be improbable. If any one can give an explanation of the origin and nature of this growth, I hope to hear from him.

NOTE 3.—Lentodium squamulosum was described by Morgan who claims it to be a good genus. It is generally considered a diseased form of Lentinus tigrinus. Whether it is or is not a distorted form of Lentinus tigrinus, it is a curious fact that it is frequent in this county and the normal form very rare, while in Europe, the home of Lentinus tigrinus, no such form is known. The name Lentodium squamulosum is convenient in any case.

NOTE 4.—Our western species of Montagnites only occurs in the deserts. Harkness referred it to Montagnites Candollei of the Mediterranean regions. It is a smaller plant, but scantily known, and I do not know whether or not it is the same as the European. The genus Montagnites is a curious genus, very close to Gyrophragmium, but has gills lamellate.

NOTE 5.—At least the "veins" on the specimen were very noticeable. I am inclined to think the species is only an aberrant form.

NOTE 6.—This plant corresponds to the ordinary form of Lenzites betulina excepting that the pileus was most beautifully "fluted." I do not know of any description of such a form.

NOTE 7.—This specimen seems to be a "new species," and we have labelled it Lycoperdon Californicum. It is close to atropurpureum and umbrinum. We did not "describe" it in our recent Lycoperdon article as we would prefer to have more collections before describing it, to decide if the plant is constant or not.

PUFF BALL LETTER NO. 5.

Paris, May, 1905.

When we went to Paris in the spring of 1903 we requested our correspondents to send in Gastromycetes. So many have kindly complied with our request that we feel that we now have a very fair knowledge of the species that occur in Europe. The results are published (partially) in Mycological Notes No. 19, "The Lycoperdons of Europe." This paper will be followed by others until the field is covered. At the time we received the specimens, our opinion of the genus Lycoperdon was only in a formative stage. This list is our mature decision in regard to each specimen. Plants not belonging to the section Lycoperdaceæ are not acknowledged in this paper.

We beg to advise our friends and correspondents that we shall spend the present summer in Europe. The most of the season we shall be in the woods of Sweden, but we shall return to Paris (107 Boulevard St. Michel) at the close of the collecting season, when we shall be glad to receive such specimens as our friends may send us. We shall take up a special study of Nidulariaceæ and Hymenogasters (and perhaps the Tuberaceæ) and shall be glad to receive specimens of these families particularly, but any Gastromycetes will be very acceptable. Our publications are sent regularly to those who favor us with specimens.

C. G. LLOYD,
107 Boulevard St. Michel,
Paris, France.

ACKNOWLEDGMENT OF THE LYCOPERDACEÆ RECEIVED FROM CORRESPONDENTS IN EUROPE, SEASON OF 1903 AND 1904.

ACLOQUE, A., France:

Lycoperdon atropurpureum, gemmatum, pratense, spadiceum, **Scleroderma** Cepa.

ARANZADI, T. de, Spain:

Geaster hygrometricus, **Lycoperdon** cupricum, umbrinum.

BARBIER, M., France:

Lycoperdon gemmatum, pratense.

BEZZI, MARIO, Italy:

Geaster hygrometricus, **Lycoperdon** hungaricum, pratense, pusillum, umbrinum, **Scleroderma** verrucosum, **Tylostoma** mammosum.

BOUDIER, E., France:

Geaster fimbriatus, pectinatus, **Lycoperdon** echinatum, nigrescens, **Scleroderma** Cepa, **Tylostoma** granulosum, mammosum, squamosum.

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BRESADOLA, G., Austria:

Geaster coronatus, fimbriatus, pectinatus, Schmidelii, **Lycoperdon** candidum, atropurpureum, gemmatum, hiemale, pusillum, pratense, umbrinum, **Tylostoma** mammosum, squamosum.

BRUNNTHALER, J., Austria:

Geaster cororatus, fimbriatus, pectinatus, **Lycoperdon** piriforme, gemmatum, polymorphum, **Tylostoma** mammosum.

CROSSLAND, C., England:

Geaster Bryantii.

CRUCHET, D., Suisse:

Geaster fimbriatus, hygrometricus, **Lycoperdon** Desmazieres, echinatum, gemmatum, **Scleroderma** aurantium, verrucosum, Cepa, **Tylostoma** mammosum.

EYRE, WM. L., England:

Geaster fimbriatus, **Lycoperdon** echinatum, gemmatum, piriforme.

FAUTREY, F., France:

Geaster coronatus, **Lycoperdon** piriforme.

FERRY, RENE, France:

Geaster fimbriatus.

GILLOT, X., France:

Geaster fimbriatus, **Lycoperdon** cepaeforme, echinatum.

HAGLUND, ERIK, Sweden:

Geaster coronatus, **Lycoperdon** gemmatum, hungaricum, nigrescens, umbrinum, **Scleroderma cepa.**

HARIOT, P., France:

Lycoperdon polymorphum, **Polysaccum** crassipes.

HENNINGS, Dr., Berlin:

Scleroderma verrucosum, **Tylostoma** granulatum.

HOLLÓS, L., Hungary:

Geaster coronatus, fimbriatus, floriformis, fornicatus, striatulus, rufescens, Schmidelii, **Lycoperdon** atropurpureum, echinatum gemmatum, piriforme, polymorphum, hiemale, pusillum, spadiceum, umbrinum, **Secotium** acuminatum, **Tylostoma** granulosum, mammosum, squamosum, **Myriostoma** coliforme.

HOLMES, E., England:

Geaster Bryantii.

HUE, L'ABBE, France:

Geaster asper, floriformis, **Tylostoma** mammosum, squamosum.

JAAP, OTTO, Germany:

Lycoperdon cepaeforme, gemmatum, piriforme, pratense, pusillum, umbrinum, **Scleroderma** Cepa, verrucosum.

JACZEWSKI, A., Russia:

Lycoperdon spadiceum, **Myriostoma** coliforme, **Battarrea** Stevenii.

KRUEGER, W., Germany:

Lycoperdon cepaeforme, gemmatum.

LAGARDE, J., France:

Geaster fimbriatus, hygrometricus, **Lycoperdon** fuscum, gemmatum, spadiceum, atropurpureum, echinatum, **Scleroderma** Cepa.

LIND, J., Denmark:

Lycoperdon cupricum, gemmatum, pratense, spadiceum, **Scleroderma** aurantium. .

LUDWIG, J., France:

Geaster Bryantii.

MAGNUS, P., Germany:

Lycoperdon gemmatum, piriforme, hiemale, **Tylostoma** granulosum, **Geaster** saccatus.

MAINGAUD, E., France:

Lycoperdon gemmatum, umbrinum.

MATTIROLO, O., Italy:

Geaster hygrometricus, **Lycoperdon** atropurpureum, umbrinum, gemmatum, marginatum, pratense, **Scleroderma** Geaster, aurantium verrucosum.

MILES, MARY L., Scotland:

Lycoperdon nigrescens, piriforme.

NEGER, F. W., Sweden:

Lycoperdon gemmatum, nigrescens.

NOACK, FRITZ, Gernsheim a/Rhein:

Scleroderma aurantium Cepa.

PATOUILLARD, N., France:

Lycoperdon cepaeforme, cruciatum, gemmatum, hiemale, pratense, pusillum, spadiceum, umbrinum, velatum, **Tylostoma** brumale.

REA, CARLETON, England:

Geaster fornicatus.

RENAUDET, G., France:

Geaster hygrometricus.

RICK, REV. J., Portugal:

Geaster asper, minimus, triplex.

ROLLAND, L., France:

Geaster hygrometricus, Schmidelii, **Lycoperdon** atropurpureum, cepaeforme, pratense, gemmatum, Desmazieres, spadiceum, umbrinum, nigrescens, piriforme, **Scleroderma** Cepa, **Tylostoma** granulosum.

ROMELL, L., Sweden:

Geaster Bryantii, coronatus, pectinatus, rufescens, saccatus, triplex, **Lycoperdon** atropurpureum, gemmatum, nigrescens, piriforme, polymorphum, pratense, serotinum, **Scleroderma** verrucosum, Cepa.

ROMPEL, JOS., Austria:

Lycoperdon gemmatum, umbrinum, nigrescens, pratense.

ROUSSEAU, MADAME, Belgium:

Lycoperdon cepaeforme, Desmazieres, fuscum, gemmatum, spadiceum, **Scleroderma** aurantium, **Tylostoma** squamosum.

SCHULTZE-WEGE, J., Germany:

Geaster coronatus, pectinatus, rufescens, Schmidelii, **Lycoperdon** atropurpureum, pratense, cupricum, Desmazieres, elongatum, gemmatum, umbrinum, **Scleroderma** aurantium, Cepa.

SMITH, ANNIE LORRAINE, England:

Lycoperdon Desmazieres, pratense, echinatum, gemmatum.

STUDER, B., Switzerland:

Lycoperdon piriforme.

SWANTON, E. W., England:

Lycoperdon gemmatum, **Scleroderma** aurantium, verrucosum.

TORREND, FATHER, Portugal:

Lycoperdon atropurpureum, elongatum, delicatum, fuscum, gemmatum, hungaricum, polymorphum, pratense, umbrinum, **Scleroderma** aurantium

VAN BAMBEKE, C., Belgium:

Lycoperdon gemmatum, hungaricum, piriforme, pratense, spadiceum, **Tylostoma** mammosum.

WEIDMANN, A., Bohemia:

Geaster fimbriatus, hygrometricus, **Lycoperdon** cruciatum, atropurpureum, cupricum, gemmatum, nigrescens, piriforme, pratense, pusillum, spadiceum, **Scleroderma** verrucosum, aurantium, **Polysaccum** arenarium.

LETTRE N° 6

Paris, Juin 1905

J'ai l'honneur d'aviser mes amis et correspondants que je me trouve de nouveau à Paris où je resterai quelques semaines pour aller ensuite passer l'été en Suède. Je reviendrai à Paris à la fin de la saison des champignons, et me ferai alors un plaisir d'indiquer les noms de celles des Gastéromycètes dont mes amis m'auront gratifié, au cours de la présente saison. J'aime à croire, que les personnes qui reçoivent mes publications, se rappellent que celles-ci leur sont envoyées pour encourager la récolte de spécimens. Ce n'est que par l'étude d'abondants matériaux provenant de localités différentes, que l'on est à même d'arriver à des conclusions correctes en ce qui concerne les espèces trouvées et leur distribution.

Voici les spécimens d'Europe qui m'attendaient à mon retour à Paris :

De **Madame A. Montague,** Angleterre : Scleroderma cepa, Calvatia saccata, Lycoperdon gemmatum, Lycoperdon piriforme, Crucibulum vulgare, Cyathus striatus, Daldinea concentrica.

De **M. Chas Crossland,** Angleterre : Calvatia saccata (lacunose) Calvatia saccata (even), Lycoperdon gemmatum, Geaster triplex (unopened).

De **M. Otto Harz,** en Bavière : (Récolte faite dans le Tyrol méridional). Calvatia saccata, Calvatia caelata, Lycoperdon nigrescens, Bovista plumbea : Lycoperdon cepaeforme, Lycoperdon pratense, Lycoperdon cruciatum. La dernière est une espèce rare en Europe. (Voir Myc. Notes n° 19). Mais évidemment le D^r^ Harz l'a trouvée en abondance, puisqu'il en a envoyé 3 collections. Le D^r^ Harz a envoyé également 3 collections de Lycoperdons qui me sont inconnus et, je crois, inédits. Ils seront décrits et figurés en détail dans les Mycological Notes. Le fait que le D^r^ Harz a trouvé ces nouveautés est remarquable, car les Vesse-de-loups d'Europe sont généralement bien connues. Je crois cependant que les régions montagneuses renferment encore quelques nouveautés.

Du **Rév. P. Meriano,** d'Espagne : De bons spécimens de Polysaccum crassipes, Scleroderma cepa, Scleroderma Geaster et Bovistella Ohiensis.

Bovistella Ohiensis est une espèce très commune aux Etats-Unis. Elle a été récoltée il y a longtemps, par Montagne, en Algérie et, plus récemment, par le professeur Patouillard, également en Algérie.

Ces spécimens n'ont pas la même couleur que les nôtres en Amérique, et vu l'absence de cortex, je ne suis pas sûr qu'elles sont identiques. Mais l'espèce du Révérend P. Meriano est sûrement la même ; *c'est du reste la première fois qu'elle est récoltée en Europe.*

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Du **Rév. P. D. G. Navas**, d'Espagne : Bovista plumbea (et quelques Polyporées et autres familles que je n'ai pas spécialement examinées).

Du **Rév. P. A. Breitung,** Danemark : Trogia crispa, Panus stipticus, Discina venosa, Cyathus vernicosus, Crucibulum vulgare, Xylaria polymorphum, Scleroderma cepa, Lycoperdon piriforme, Lycoperdon pratense, Geaster triplex, Calvatia caelata.

Le Rév. P. Breitung m'a envoyé deux champignons d'un grand intérêt, les premiers que j'en ai reçus d'Europe: 1° Une forme bronzée de *Lycoperdon piriforme*. Elle a les même caractères, quant aux spores, au cortex etc., que la forme habituelle de cette espèce, mais en diffère par sa coloration cuivrée ; son aspect général est celui du *Lycoperdon cupricum* mais il a les spores lisses et un cortex différent. 2° Une petite espèce que je suppose être *Bovistella echinella*, mais qui nécessite d'autres investigations et comparaisons avant que j'en sois sûr. Elle a primitivement été décrite de l'Equateur sous le nom de *Bovista echinella*, mais je l'ai rarement reçue et seulement de stations très distantes l'une de l'autre, des Etats-Unis et du Mexique.

Cet échantillon est le premier qui m'est soumis d'Europe.

De **M. le D^r^ Otto Pazschke,** Leipzig : Myriostoma coliformis, champignon en général rare en Europe, Geaster striatulus (spécimens plus grand que d'habitude), Geaster fimbriatus, Geaster rufescens, Geaster coronatus.

De **M. Ch. Panau**, France : Lycoperdon gemmatum, Geaster fimbriatus, Lycoperdon spadiceum (spécimen beaucoup plus grand que celui que représente ma planche de cette espèce dans Myc. Notes n° 19).

Du **Rév. P. A. Luisier,** Tyrol : Geaster rufescens, Lycogala Epidendrum, Lycoperdon gemmatum, Lycoperdon polymorphum, Lycoperdon spadiceum, Lycoperdon atropurpureum (? — à l'état jeune), Geaster fimbriatus (forme habituelle), Geaster fimbriatus, forme que je n'avais pas encore vue et qui peut-être mériterait un nom spécial. Avec les caractères généraux de l'epèce, l'exoperidium est beaucoup plus lisse, plus mince et plus pâle que d'habitude ; l'endoperidium est également plus pâle de couleur.

Du **Rév. P. Paul Bovier-Lapierre,** Angleterre : Bovista plumbea, Lycoperdon piriforme, Lycoperdon pusillum, Lycoperdon pratense.

Du **Rév. P. T. Zimmermann,** Angleterre : Lycoperdon piriforme.

Les Mycological Notes n° 19 contiendront une monographie des espèces européennes de Lycoperdons ; le n° 20, celle des Etats-Unis.

Ces deux numéros étaient entre les mains de l'imprimeur quand j'ai quitté l'Amérique et parviendront sous peu à mes correspondants.

C. G. LLOYD

107, Boulevard Saint-Michel

PARIS, FRANCE

LETTER No. 7.

PARIS, June, 1905.

On my return to Paris I found a number of packages from correspondents in Europe which have been acknowledged in detail in Letter No. 6. There were also many interesting specimens from foreign countries.

Mr. D. McAlpine, Australia, sends a large assortment of specimens, fully half as many as have reached Europe in previous years combined. Among them are the following which have been considered in the Lycoperdaceæ of Australia: Mitremyces fuscus, Mycenastrum Corium, Geaster rufescens, Scleroderma flavidum, Lycoperdon pratense, Lycoperdon gemmatum, Geaster Drummondii, Geaster floriformis, Arachnion Drummondii, Catastoma hypogæum, Lycoperdon nigrum, Geaster minimus, Lycoperdon pusillum, Geaster striatulus, Geaster simulans, Calvatia candida, Battarrea phalloides, Lycoperdon cepaeforme, Lycoperdon polymorphum. There are also a number of plants that I wish to study further, and which will be considered in detail in Mycological Notes: undescribed species of Mesophellia, Scleroderma, Bovistella, and Arachnion, as well as a number of fine collections of Tylostoma (3 species) and Catastoma.

Mr. F. M. Reader, Australia, sends Lycoperdon cepaeforme, Calvatia candida, Bovistella aspera, Phellorina australis (young), Lycoperdon nigrum, and two collections of Tylostomas. The fine collections of Tylostomas from both Messrs. Reader and McAlpine will give a better knowledge of this genus in Australia than all the fragmentary specimens that have hitherto reached Europe.

Dr. Wm. Herbst, Pennsylvania, sends Mitremyces Ravenelii. The statement on page 126 of Mycological Notes that Dr. Herbst has found Mitremyces cinnabarinus in Pennsylvania, but that I have not seen his specimens, is an error. Mitremyces Ravenelii is the only species that occurs with him.

Mr. K. Miyabe, Japan, sends Geaster saccatus, Mitremyces Ravenelii, Geaster rufescens, Geaster hygrometricus, Lycoperdon gemmatum, Scleroderma tenerum, Geaster minimus, Polysaccum pisocarpium, Lycoperdon pratense, Lycoperdon piriforme, Lycoperdon serotinum; also an undescribed species of Bovistella, which I shall call Bovistella Miyabei, and several collections of Lycoperdon and Cyathus that will require further study.

Mr. T. Yoshinaga, Japan, sends Scleroderma flavidum, Lycoperdon gemmatum, Lycoperdon piriforme, and three collections of Lycoperdon that will have further study, viz.: Lycoperdon (cfr. cruciatum), Lycoperdon (cfr. pusillum), Lycoperdon (cfr. cepaeforme).

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Mr. Thos. H. Norton, United States Cousul at Harput, Turkey (now consul to Smyrna, Turkey), sends a collection, valuable chiefly as an evidence of his good intentions to aid me in the work. Unfortunately it consists mostly of dried agarics and other families that I do not study. My sincere thanks are extended to my friend, Professor Norton, for the trouble he has taken in the matter.

Rev. A. Boulomoy, Syria, sends me Lycogala flavofuscum, Daldinea concentrica, Scleroderma cepa, Geaster hygrometricus, a form of Scleroderma aurantium, not exactly the same as occurs in Europe and the United States; also a form of Scleroderma cepa, differing from the form that occurs in Europe by having the base prolonged into a stipe almost two inches long.

Mr. H. E. Cox, Jamaica, a dried specimen of Phallus phalloidea.

Mr. Geo. S. Jenman, British Guyana, a specimen of Cyathus in alcohol.

Mr. J. Medley Wood, Natal, sends a Lycoperdon that seems to be restricted to Africa. It is a Lycoperdon agreeing with Lycoperdon cruciatum in everything except the color of the gleba, which is purplish. It has received certainly two, and probably three, names. Lycoperdon djurensis and Lycoperdon entotephrum (Bull. Soc. Myc. 02–38) are surely the plant; also, I think, probably Lycoperdon natalense (J. R. Mic. Soc. 87–709). At the time I examined the latter I thought it was Lycoperdon pratense (a very closely related species), which I have since learned is the common species in South Africa; hence I presume this will turn out to be the same.

Mr. E. W. Foster, Lagos, sends Calvatia lilacina, which, notwithstanding it is a common species in many countries of the world, is of much interest in extending our knowledge of the distribution of this species.

Mr. Wm. Gollan, British India, sends a number of interesting plants which I have not had time to study in detail.

Rev. J. Rick, Brazil, sends three packages. I have as yet had time to merely look through them. They will prove most interesting to study. Among others I note a curious Geaster, the exoperidium covered with coarse, strigose hairs such as is possessed by no known species. I shall call it Geaster Rickei.

I beg to advise my friends and correspondents that I shall spend the next four months in the woods in Sweden, and shall return to Paris about November 1st. I expect then to publish in detail regarding the numerous interesting specimens with which I have been, and may in the meantime be, favored by my correspondents.

C. G. LLOYD,
107 BOULEVARD ST. MICHEL,
PARIS, FRANCE.

PUFF BALL LETTER NO. 8.

Paris, December, 1905.

We are particularly anxious to obtain specimens of puff balls from Australia and New Zealand, for although these countries are probably the richest in these peculiar growths yet less is known concerning their puff ball flora than of any other portion of the world. We are grateful to those who have collected and forwarded specimens, for as a result more has been learned about Australian forms from specimens received by me in the last two years than all that was previously known of the subject. Still only a beginning has been made. It is the simplest matter in the world to pick up specimens when you notice them, and if those who receive our circular will do so and forward them to me, only a few years will pass until we shall have a satisfactory knowledge of the subject. In that case we promise to give Australian botanists an illustrated work on the subject, by means of which the Australian species can be determined. *Will you not aid in this work?* Every specimen received will be acknowledged in the publication.

We have received to date specimens from the following contributors, and express herewith our thanks to the senders. In addition to the specimens listed, we have received a number of Phalloids and Nidulariaceæ, which are families we have not as yet studied. Also from Messrs. Reader and McAlpine a fine lot of Tylostomas which will receive careful attention at an early date.

In April, 1905, we issued a preliminary pamphlet entitled "The Lycoperdaceæ of Australia, New Zealand, and the Neighboring Islands." This will be gladly sent to those interested in the subject, upon receipt of a request. In the next issue of Mycological Notes will be found an extended article concerning specimens received since that pamphlet was issued.

C. G. LLOYD,
107 Boulevard St. Michel,
Paris, France.

ACKNOWLEDGMENT OF SPECIMENS RECEIVED FROM CORRESPONDENTS IN AUSTRALIA AND NEW ZEALAND, SEASON OF 1904 AND 1905.

BAKER, R. T., Sydney, Australia:

Calvatia lilacina, **Catastoma** anomalum, **Geaster** plicatus, **Lycoperdon** cepæforme, **Podaxon** ægyptiacus, **Polysaccum** crassipes, **Scleroderma** Cepa (?).

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BROWN, ROBERT, Christchurch, N. Z.:

Bovistella australiana, **Calvatia** cælata, **Calvatia** gigantea, **Geaster** saccatus, **Lycoperdon** cepæforme, **Lycoperdon** pratense, **Lycoperdon** pusillum, **Mycenastrum** Corium, **Scleroderma** Cepa (?), **Secotium** erythrocephalum.

DUNN, MISS JESSIE, Wellington, N. Z :

Calvatia lilacina, **Geaster** floriformis, **Lycoperdon** cepæforme, **Lycoperdon** polymorphum, **Lycoperdon** pratense, **Scleroderma** verrucosum (?).

GILL, WALTER, Adelaide, Australia:

Calvatia candida, **Calvatia** lilacina, **Lycoperdon** cepæforme, **Polysaccum** pisocarpium, **Scleroderma** flavidum.

GUILFOYLE, W. R., Melbourne, Australia:

Geaster saccatus, **Lycoperdon** polymorphum, **Mycenastrum** Corium, **Polysaccum** pisocarpium, **Polysaccum** crassipes, **Scleroderma** flavidum.

LAING, ROBERT M., Christchurch, N. Z.:

Calvatia cælata, **Catastoma** hypogæum, **Lycoperdon** pratense.

McALPINE, PROF. D., Melbourne, Australia:

Arachnion album, **Arachnion** rubrum, **Battarrea** phalloides (? remnant), **Bovistella** bovistoides, **Bovistella** Gunnii, **Calvatia** candida, **Calvatia** olivacea, **Catastoma** (sp. ?), **Geaster** Drummondii, **Geaster** floriformis, **Geaster** minimus, **Geaster** Readeri, **Geaster** striatulus, **Lycoperdon** cepæforme, **Lycoperdon** gemmatum, **Lycoperdon** nigrum, **Lycoperdon** polymorphum, **Lycoperdon** pratense, **Lycoperdon** pusillum, **Mitremyces** fuscus, **Mycenastrum** Corium, **Scleroderma** flavidum, **Scleroderma** Geaster, **Scleroderma** radicans.

PAUL, J. T., Grantville, Australia:

Bovistella australiana, **Bovistella** scabra, **Calvatia** lilacina, **Geaster** floriformis, **Geaster** plicatus, **Geaster** saccatus, **Geaster** velutinus, **Lycoperdon** pratense, **Polysaccum** pisocarpium, **Polysaccum** tuberosum, **Scleroderma** flavidum.

READER, F. M., Casterton, Australia:

Battarrea Stevenii (? remnant), **Bovistella** bovistoides, **Bovistella** scabra, **Calvatia** candida, **Geaster** Readeri, **Lycoperdon** cepæforme, **Lycoperdon** nigrum, **Lycoperdon** polymorphum, **Mycenastrum** Corium, **Phellorina** australis, **Polysaccum** pisocarpium, **Scleroderma** flavidum.

TENNANT, J. S., Ashburton, N. Z.:

Lycoperdon pratense.

TEPPER, J. G. O., Norwood, Australia:

Bovistella scabra, **Calvatia** candida, **Calvatia** gigantea, **Geaster** minimus, **Geaster** Schmidelii, **Lycoperdon** pusillum, **Mycenastrum** Corium.

WATTS, W. W., Sydney, Australia:

Bovistella aspera.

LETTER No. 9.

Kew, England, February, 1906

Since my last letter of acknowledgment was issued (June, 1905) I have received at my Paris address, 107 Boulevard St. Michel, the following list of specimens. Many of them from Australia and Europe are of such special interest on account of rarity that they will be considered in detail and illustrated in the next two issues (No. 21 and No. 22) of Mycological Notes, which are now in the printer's hands. I am advised that a large number of specimens have been sent during the past season to my Cincinnati address. These have been shipped to Paris, and I shall probably find them on my return to that city next month. They will be acknowledged in detail in the next letter.

AUSTRALIA AND NEW ZEALAND.

BROWN, ROBERT, New Zealand:

Geaster saccatus, **Hysterangium** carneum, **Secotium** erythrocephalum.

GILL, WALTER, Australia:

(Collected at Tumby Bay, Australia). **Battarrea** phalloides (rare in Europe, but seems to be more common in Australia), **Geaster** Smithii (only previously known from Florida, United States).

GUILFOYLE, W. R., Australia:

Scleroderma flavidum.

PAUL, J. T., Grantville, Australia:

Bovistella, australiana, **Bovistella** scabra, **Geaster** floriformis, **Geaster** plicatus, **Geaster** saccatus, **Geaster** velutinus, **Lycoperdon** pratense, **Polysaccum** pisocarpium, **Scleroderma** flavidum.

READER, F. M., Australia:

Battarrea Stevenii (remnant), **Bovistella** scabra, **Calvatia** candida, **Geaster** Readeri, **Lycoperdon** cepaeforme, **Lycoperdon** nigrum, **Polysaccum** pisocarpium, **Scleroderma** flavidum.

TEPPER, J. G. O., South Australia:

Bovistella bovistoides, **Geaster** Schmidelii, **Lycoperdon** pusillum, **Tylostoma** albicans.

MISCELLANEOUS FOREIGN.

GILLOT, DR. X., Tunis:

Phellorina Delestrei, an abundant and fine collection, more and better specimens than are now in all the museums of Europe combined. **Tylostoma** caespitosum (a very rare species, known from only a few localities

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in Northern Africa. These are the first good specimens I have ever seen. They have been used for illustration in the forthcoming pamphlet on the genus Tylostoma, now in the printer's hands.)

HARIOT, P. (From Museum of Paris.)

Calvatia lilacina (Java), **Geaster** triplex (collected by M. Godefroy, Cambodge, Asia), **Lycoperdon** ostiolatum (type from Java), **Tylostoma** Leveilleanum (type from Hawaii).

KUSANO, S., Tokyo, Japan:

Cyathus (three collections, not yet studied critically), **Mitremyces** Ravenelii.

LABESSE, DR., Angers, France:

(From the Congo, Africa). **Clathrus** cameroensis (?), **Guepinia** spathularia.

MILLE, REV. LOUIS, Ecuador, South America:

Lycoperdon cruciatum. (A common plant in North America, but this is the first time it is known from South America under its proper name. It probably figures as one of Spegazzini's "new species."

NAMBU, N., Tokyo, Japan:

Scleroderma tenerum.

WINKLER, DR., Kamerun, Africa:

Calvatia (undescribed), **Geaster** Archerii, **Geaster** saccatus, **Lycoperdon** pusillum.

FRANCE.

ACLOQUE, A., Abbeville, France:

Cyathus vernicosus, **Lycoperdon** pratense, **Lycoperdon** spadiceum, **Lycoperdon** umbrinum, **Scleroderma** verrucosum.

ARNOULD, LEON, Ham, France:

Lycoperdon gemmatum, **Lycoperdon** nigrescens, **Scleroderma** verrucosum.

BARBIER, M., Dijon, France:

Lycoperdon gemmatum, **Lycoperdon** piriforme, **Lycoperdon** pratense, **Scleroderma** Cepa, **Scleroderma** verrucosum, **Tylostoma** mammosum.

BIGEARD, RENE, Nolay, France:

Bovista plumbea, **Calvatia** caelata, **Calvatia** saccata, **Lycoperdon** cruciatum, **Lycoperdon** gemmatum, **Lycoperdon** pratense, **Lycoperdon** piriforme, **Lycoperdon** spadiceum, **Lycoperdon** umbrinum, **Scleroderma** verrucosum.

BOURDOT, REV. H., Allier, France:

Battarrea phalloides (specimen from Ernest Olivier, the discoverer of the only known station in France), **Calvatia** caelata, **Calvatia** lilacina, **Catastoma** subterraneum (this is the second known collection in France), **Crucibulum** vulgare, **Cyathus** striatus, **Cyathus** vernicosus, **Cyathus** (sp. ?), **Geaster** elegans (rare), **Geaster** hygrometricus, **Geaster** rufescens, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Lycoperdon** pusillum, **Lycoperdon** velatum (a form closely approaching Lycoperdon floccosum of the United States, cfr. plate 59), **Scleroderma** Cepa, **Scleroderma** tenerum (the form of verrucosum which is only common in the United States), **Sphaerobolus** stellatus, **Tylostoma** mammosum, **Tylostoma** Petrii (?).

FELIX, CAPTAIN PYAT, Angers, France:

Bovista plumbea, **Calvatia** caelata, **Calvatia** saccata, **Crucibulum** vulgare, **Cyathus** stercoreus (rare in Europe), **Lycoperdon** cepaeforme, **Lycoperdon** echinatum, **Lycoperdon** gemmatum, **Lycoperdon** nigrescens, **Lycoperdon** piriforme, **Lycoperdon** pratense, **Lycoperdon** pusillum, **Lycoperdon** umbrinum, **Scleroderma** aurantium, **Scleroderma** Cepa, **Sphaerobolus** stellatus, **Tylostoma** brevipes (?), **Tylostoma** granulosum, **Tylostoma** pallidum.

GILLOT, DR. X., Autun, France:

Crucibulum vulgare, **Lycoperdon** gemmatum, **Lycoperdon** umbrinum, **Scleroderma** Cepa, **Tylostoma** mammosum.

GRELET, L. J., Savigne, France:

Bovista plumbea, **Calvatia** caelata, **Calvatia** gigantea, **Lycoperdon** cepaeforme, **Lycoperdon** gemmatum, **Lycoperdon** umbrinum.

HARIOT, P., France:

Elaphomyces asperulus, **Elaphomyces** echinatus, **Geaster** triplex, **Polyporus** nodulosus, **Tuber** melanosporum, **Tuber** rufum.

KLINCKSIECK, PAUL, Dauphiné France:

Bovista nigrescens, **Calvatia** caelata, **Calvatia** lilacina, **Lycoperdon** cepaeforme, **Lycoperdon** cruciatum, **Lycoperdon** pratense.

KLINCKSIECK, PAUL, Eure, France:

Calvatia saccata, **Lycoperdon** gemmatum.

KLINCKSIECK, PAUL, Paris:

Calvatia saccata, **Geaster** triplex, **Lycoperdon** atropurpureum (?), **Lycoperdon** gemmatum, **Lycoperdon** umbrinum, **Scleroderma** aurantium, **Scleroderma** verrucosum.

LUDWIG, T., Paris:

Mr. Ludwig has kindly sent me a fine collection of Hymenogasters, which will be of great service should I take up the study of this order. The specimens have been named by Mr. Ludwig.

Cenococcum geophilum, and the following species of **Elaphomyces:** anthracinus, asperulus, echinatus, granulatus, leucosporus, Leveillei, maculatus, mutabilis, variegatus, and **Geaster** asper, **Geaster** asper (? departing from the usual from), **Geaster** pectinatus.

MAIRE, R., Nancy, France:

Bovista plumbea, **Calvatia** saccata, **Geaster** coronatus, **Geaster** fimbriatus, **Lycoperdon** atropurpureum (obese form), **Lycoperdon** echinatum, **Lycoperdon** nigrescens, **Lycoperdon** (cfr. Myc. Notes, No. 22).

OLIVIER, ERNEST, Allier, France:

Battarrea phalloides. Mr. Olivier is the only collector in France to find this species. He has found it in one locality for several years. A full account will be given in the Tylostoma pamphlet now in press.

PANAU, CHARLES, Verdun, France:

Calvatia saccata, **Geaster** rufescens, **Lycoperdon** gemmatum, **Lycoperdon** umbrinum, **Scleroderma** aurantium.

PATOUILLARD, N., Paris:

(From his herbarium). **Cyathus** affinis (type), **Cyathus** minimus (type), **Tylostoma** Berkeleyii. (See forthcoming pamphlet on the Tylostomæ. It is a frequent species in the United States, usually misnamed Tylostoma fimbriatum.)

ROBERT, DR., Nice, France:

Lycoperdon umbrinum.

ROLLAND, L., Paris, France:

Bovista plumbea, **Crucibulum** vulgare, **Cyathus** striatus, **Geaster** fimbriatus, **Geaster** mammosus, **Lycoperdon** cepaeforme, **Lycoperdon** echinatum, **Lycoperdon** excoriatum (a form of gemmatum, vide Myc. Notes, plate 60, the first specimen I have from Europe), **Lycoperdon** piriforme, **Lycoperdon** umbrinum, **Polysaccum** pisocarpium, **Scleroderma** Cepa, **Scleroderma** verrucosum.

ROLLAND, L., South of France:

Clathrus cancellatus.

GERMANY.

ENGELKE, KARL, Hanover:

Crucibulum vulgare, **Cyathus** striatus, **Cyathus** vernicosus, **Geaster** coronatus, **Geaster** fimbriatus, **Lycoperdon** echinatum, **Lycoperdon** gemmatum, **Lycoperdon** (cfr. Myc. Notes, No. 22), **Mutinus** caninus, **Scleroderma** aurantium, **Sphaerobolus** stellatus.

JAAP, OTTO, Germany:

Bovista plumbea, **Calvatia** caelata, **Crucibulum** vulgare, **Cyathus** striatus, **Nidularia** pisiformis, **Lycoperdon** cepaeforme, **Lycoperdon** echinatum, **Lycoperdon** gemmatum, **Lycoperdon** nigrescens, **Lycoperdon** piriforme, **Lycoperdon,** spadiceum, **Lycoperdon** umbrinum, **Sphaerobolus** stellatus.

KRIEGER, WM., Köningstein, Germany:

Polysaccum crassipes.

PLÖTTNER, PROF., Rathenow, Germany:

Bovista nigrescens, **Bovista** plumbea, **Bovistella** Ohiensis (the second collection known in Europe), **Bovistella** pedicellata (a rare plant in Europe), **Crucibulum** vulgare, **Cyathus** striatus, **Cyathus** vernicosus, **Geaster** saccatus, **Geaster** Schmidelii, **Lycoperdon** cepaeforme, **Lycoperdon** hungaricum, **Lycoperdon** pratense, **Lycoperdon** umbrinum, **Polysaccum** pisocarpium, **Scleroderma** aurantium, **Tylostoma** granulosum.

SCHULTZE-WEGE, MADAME, Weimar, Germany:

Calvatia saccata (?), **Crucibulum** vulgare, **Geaster** Bryantii, **Lycoperdon** atropurpureum, **Lycoperdon** echinatum, **Lycoperdon** fuscum, **Lycoperdon** piriforme (?), **Lycoperdon** pratense, **Lycoperdon** pusillum, **Lycoperdon** spadiceum, **Lycoperdon** umbrinum, **Lycoperdon** (cfr. Myc. Notes, No. 22).

ENGLAND.

EYRE, W. L. W., England:

Lycoperdon echinatum, **Lycoperdon** gemmatum, **Lycoperdon** polymorphum (form?), **Lycoperdon** umbrinum, **Lycoperdon** velatum (a rare plant in England, recently illustrated in Trans. Myc. Society. It has also been found in England and recorded recently under the misdetermination of Lycoperdon cruciatum, a species which has never been collected in England).

GARDNER, FRED, Newport, England:

Scleroderma aurantium.

MILES, MISS M. L., Perth, Scotland:

Bovista nigrescens.

SWANTON, E. W., Surrey, England:

Crucibulum vulgare, **Lycoperdon** echinatum, **Lycoperdon** gemmatum.

TORREND, REV. C., Milltown Park, England:

Bovista plumbea, **Calvatia** (?), **Lycoperdon** pratense.

UNKNOWN DONOR, "Vale of Chuyd," North Wales:

Calvatia caelata, **Calvatia** saccata, **Cyathus** vernicosus, **Lycoperdon** gemmatum, **Lycoperdon** pratense, **Lycoperdon** spadiceum, **Lycoperdon** turbinatum (a form of L. gemmatum, illustrated, Myc. Notes, No. 22).

ITALY.

BADET, REV. L., Salussola, Italy:

Arachnion album (the first collection ever made in Europe), **Geaster** giganteus (a form of hygrometricus, rare in Europe), **Geaster** hygrometricus, **Lycoperdon** cruciatum, **Lycoperdon** pusillum, **Scleroderma** aurantium, **Scleroderma** Cepa.

BEZZI, PROF. MARIO, Torino, Italy:

Bovista nigrescens, **Bovista** plumbea, **Lycoperdon** atropurpureum (?), **Lycoperdon** cruciatum, **Lycoperdon** pusillum, **Lycoperdon** (cfr. Myc. Notes, No. 22), **Scleroderma** verrucosum.

CAVARA, PROF. F., Sicily:

Lycoperdon spadiceum, **Mycenastrum** (?) too young to determine, but surely a new plant for Europe, if not undescribed. An illustration and detailed account will be found in Myc. Notes, No. 22.

MASSALONGO, PROF. C., Italy:

Bovista brunnea, **Calvatia** saccata (?), **Lycoperdon** cepaeforme, **Lycoperdon** pratense, **Lycoperdon** spadiceum, **Lycoperdon** umbrinum, **Lycoperdon** (cfr. Myc. Notes, No. 22).

SCALIA, DR. G., Sicily:

Cyathus vernicosus, **Myriostoma** coliformis (an infrequent plant), **Tylostoma** (species not known to me).

BELGIUM.

NIJPELS, PAUL, Bruxelles, Belgium:

Cyathus vernicosus.

ROUSSEAU, MADAME, Belgium:

Crucibulum vulgare, **Cyathus** striatus, **Geaster** coronatus, **Geaster** fimbriatus, **Geaster** rufescens, **Geaster** Schmidelii, **Lycoperdon** gemmatum, **Lycoperdon** pratense, **Sphaerobolus** stellatus.

VAN BAMBEKE, PROF. CHARLES, Belgium:

Bovista nigrescens, **Calvatia** saccata, **Cyathus** vernicosus, **Lycoperdon** gemmatum, **Lycoperdon** pratense, **Lycoperdon** spadiceum.

EUROPE—MISCELLANEOUS.

de ARANZADI, PROF. T., Barcelona, Spain:

Bovista plumbea, **Calvatia** caelata, **Calvatia** (undescribed, cfr. Myc. Notes, No. 22), **Crucibulum** vulgare, **Cyathus** vernicosus, **Lycoperdon** atropurpureum, **Lycoperdon** cepaeforme, **Lycoperdon** polymorphum, **Lycoperdon** spadiceum.

BRESADOLA, REV. G., Tirol:

Bovista tomentosa.

BUBAK, PROF. DR. FR., Tabor, Bohemia:

Crucibulum vulgare, **Gautiera** graveolus, **Gautiera** morchellaeformis, **Geaster** fimbriatus, **Geaster** triplex, **Hysterangium** clathroides, **Sphaerobolus** stellatus.

LIND, J., Viborg, Denmark:

Crucibulum vulgare, **Cyathus** vernicosus, **Geaster** triplex, **Scleroderma** Cepa.

LUISIER, REV. A., Innsbruck, Tirol:

Geaster saccatus, **Lycoperdon** piriforme.

MAIRE, R., Greece:

Bovista nigrescens (bronzed form), **Lycoperdon** nigrescens, **Lycoperdon** umbrinum, **Lycoperdon** (cfr. Myc. Notes, No. 22).

MERINO, REV. B., Spain:

Bovistella Ohiensis, **Geaster** hygrometricus, **Lycoperdon** gemmatum, **Scleroderma** aurantium, **Scleroderma** verrucosum.

PEETERS, REV. L., Holland:

Lycogala flavofuscum, **Lycoperdon** spadiceum?

RICHEN, REV. P. G., Feldkirch, Austria:

Calvatia caelata, **Lycoperdon** piriforme.

ROMPEL, PROF. JOS., Kanton Wallis, Switzerland:

Bovista brunnea, **Bovista** nigrescens, **Calvatia** saccata (?), **Lycoperdon** (cfr. Myc. Notes, No. 22).

WEIDMANN, A., Trebon, Austria:

Bovista plumbea, **Cyathus** striatus, **Lycoperdon** atropurpureum, **Lycoperdon** cepaeforme, **Lycoperdon** cruciatum, **Lycoperdon** macrogemmatum (cfr. Myc. Notes, No. 22), **Lycoperdon** pratense, **Scleroderma** Cepa, **Scleroderma** verrucosum.

Specimens of Gastromycetes will be gladly received and named for correspondents. Those who reside in Europe or foreign countries will kindly send them to

C. G. LLOYD,
107 Boulevard St. Michel,
Paris, France.

LETTER No. 10.

Paris, July, 1906.

A list of specimens received from our correspondents during the past season will be published in our next letter. As many of them are common species, and have been received a number of times, we submit a few remarks on those that are most frequent. At the present time, excepting as to Gastromycetes, we claim no critical knowledge of fungi. There have been about *twenty-eight hundred* polyporoids "described," not counting the several hundred "synonyms" given by Fries. To get even a general knowledge of the subject will require years of study and investigation. From the United States alone there are about five hundred "species" recorded. Fungi are widely distributed plants. The fungi of Europe and the United States are practically the same. We do not question but the larger part of these twenty-eight hundred are synonyms, but it is a large task to find out what they are and to learn the species that are "good." We shall devote most of our time in the immediate future to work on the European species, for it is self-evident that as the first and most of the work has been done with European species, and as the American species are largely the same, one must first acquire a knowledge of what occurs in Europe in order to be in position to judge as to those of America.

There has been so much changing of names lately in the Polyporii that we feel it well to state our position in this regard. The most and best systematic work on Polyporus was done by Fries. His system and names have been in general use for two generations, and are familiar to all. We therefore feel that no attempt should be made to change them excepting in very exceptional cases. It has become quite a fad lately to look up dates of synonyms and shuffle the names around on such evidence. There is no merit in such work, and it produces nothing but confusion. One-half of the old "synonyms" are not true or are so vague that the truth can not be ascertained, and the other half are of no importance if they are true. This, of course, applies to the species considered by Fries in his latest work. As to the extra European species, some two thousand or more, they have been mostly described at four centers—Upsala, Berlin, London, and Paris. There are without question many reduplications of names. The only thing that can be done as I see it is to hunt up and study these specimens where they exist, and then take the first name, unless there are good reasons for not taking it. As to genera, the question is not so simple. The genus Polyporus is too large and should be broken up, but I feel that as much of the old should be retained as possible, particularly the four leading sections with which we are all familiar. Also the allied genera,

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Trametes, Daedalea, etc., notwithstanding that the same plant often exhibits forms that "throw it into another genus." The leading ideas of the genera are simple and well known, and no system of classification can be devised that does not have its objections and "exceptions."

In Europe for the last twenty years there have been three men working on dividing the polyporoids into new genera. First, Karsten, then Quèlet, then Patouillard. Each has proposed his own system and his own names, and neither has met with much general favor, because, in my opinion, of the vast array of new names. Mycologists in general refuse to learn a new language in order to work with old plants. I think many good ideas are expressed in their work, but they would have been better received had they been used to subdivide the old genera, not to replace them. In America, Mr. Murrill is a little late in taking up the work, for most of it has been done before—at least three different ways. To rechristen the ideas of his predecessors and further add to the Babel of new names, is only making a bad position worse. As the European work has mostly failed to meet with favor for this very reason, I can foresee no other fate for the American. Most of my past work on the Polyporii has been in the line of collecting specimens, and sending them to authorities in both Europe and America for names. I have received so many conflicting opinions concerning the same plant that in many instances I do not know which to accept. I think that can only be decided by working out the problem in the museums of Europe.

We hope that our correspondents in America will continue to send to our Cincinnati address all the Polyporii they find. It is only from an abundance of material that any subject can be learned. We do not learn "species" in the museums of Europe. We learn them by studying them and comparing them and handling them. After they are learned we often recognize them from very inadequate specimens preserved in the museums. As at the present time we have such an imperfect knowledge of the subject, the following remarks are not offered as being of any critical value even on the most common species. However, as the work proceeds, we hope and expect to learn more.

Auricularia auricula-Judae or **Hirneola auricula-Judae.**—Probably our most common tremelloid. Grows throughout the world and is eaten by the Chinese. The common name, "Jew's ear," is a slander on the Israelitish nation.

Daedalea ambigua.—Frequent at Cincinnati on sugar maple trees. It is claimed, probably correctly, to have many names. I think the worst one yet proposed for it is "Aesculi," because a specimen so labeled is found in Schweinitz's herbarium, undoubtedly through some mistake. If descriptions count for anything it can not be "Aesculi," for not one syllable of the description of "Aesculi" applies to it. At Cincinnati it is always daedaloid, but Trametes incana is said to be the same thing.

Daedalea confragosa.—This is very common on willows and at Cincinnati on Crataegus. It is variable as to color and particularly as to the hymenium, being sometimes polyporoid, sometimes daedaloid, and sometime lenzitoid. It has more names than a Parisian Apache. Most of them are certainly only conditions, but there is a little *thin* form that seems to me ought to have a separate name, and probably has several. In France it is usually called Trametes Bulliardii or Trametes rubescens. In America it has many names (cfr. Peck's 30th Report). I believe most mycologists now call it Daedalea confragosa, though that species is reported to have "ferruginous" context, and the old plates so referred do not seem to be our plant.

Daedalea Juniperina.—Always called by Professor Ellis "Daedalea Kansensis, E. & E.," though I believe not published. The specific name "juniperina" is much more suitable for it, but it would require more than date dictionary evidence to convince me it is an "Agaricus" as recently stated.

Daedalea unicolor.—A very common plant and quite variable at different ages as to color, hence the name is not always appropriate.

Daedalea quercina.—Very common, especially in chestnut oak regions. It does not grow at Cincinnati on the red or white oaks. In Sweden it is also common. Some one has recently discovered that it should be called Agaricus (sic) quercinus, which is the source of much amusement, and I have heard a number of mycologists in Europe making sport of it.

Favolus europaeus.—I learned this plant as Favolus Canadensis, but when I sent it to Europe (Cfr. Myc. Notes, p. 59) and learned that it grew in Europe, and was there called Favolus europaeus, I employed that name. It has the advantage of having been adopted by Fries, though neither name is very appropriate for a plant that grows in both countries, and Canadensis is "prior."

Fomes carneus.—This is readily recognized by the rose color of the cortex. Whether Fomes roseus is the same, as is claimed by some and disputed by others, I do not know. It always grows on coniferous wood.

Fomes Curtisii.—This plant has more of a Southern range, though I frequently get it from New Jersey. It is claimed to be only an unvarnished form of Fomes lucidus, but has always appeared to me very distinct.

Fomes fomentarius.—Fries states it is common on beech. I think it does not occur at Cincinnati, where the beech is very prevalent. I have only collected it on birch, both in the United States and Sweden.

Fomes fraxinophilus.—Grows only on ash, and not in Europe. Fomes ulmarius of Europe, which McBride suggests may be the same, is widely different.

Fomes fulvus.—Found by me frequently at Cincinnati, only on the wild or "Chickasaw" plums. Recorded also on related trees, peach and cherry. It was determined for me by American mycologists as "Fomes supinus," and by Bresadola as "Fomes fulvus, Scop, not Fries." From its habitat it can not be "Fomes fulvus" of Fries's latest work, but I do not know what name he called it.

Fomes ignarius.—In Sweden the most common Fomes on deciduous wood, but otherwise has no choice of host. It is likewise common in the United States.

Fomes leucophaeus.—The very commonest Fomes in our country. It is so close to Fomes applanatus of Europe that I do not believe that any one would note the difference on a casual examination of the two plants, and it is not strange that the plant has been universally called Fomes applanatus in most all American literature. European mycologists have been using the microscope on the spores of Fomes, and when I sent the plant there it was noted that it had smooth spores, while the spores of Fomes applanatus are rough. It was published in Mycological Notes in 1901 (page 60), which I think was the first time attention was drawn to this popular error which had persisted in American mycology up to that date. Recently it has been announced that Léveillé first called the plant "megaloma," but I think that is largely guess work, and I have thus far been unable to find any confirmatory evidence, but have found positive proof that Léveillé determined and published the plant as "Polyporus applanatus."

Fomes pinicola.—Well named, as it grows usually on coniferous trees. Also has been the victim of a date dictionary and a very inappropriate name has been dug up for it.

Fomes rimosus.—At least as it has always been known in American mycology and always so determined when I sent it to Europe, but it is now disputed, and I have no opinion on it. It grows very commonly at Cincinnati on the locust, but has never been found at Paris, where the locust-tree, known to the French as "Acacia," is the most common, introduced shade-tree there.

Hydnum adustum.—Frequent in America, not in Europe.

Irpex pachylon.—I learned this plant as Irpex crassus, the name applied to the American plant. Specimens I have sent to Europe have been referred to Irpex pachylon by both Patouillard and Bresadola. I do not know the European plant.

Irpex tulipifera.—Called also Polyporus tulipiferus and Poria tulipifera. Said to be the same as Irpex lacteus and Poria sinuosa, concerning which I do not know. It is a very common plant at Cincinnati, particularly on the tulip-tree.

Lenzites betulina.—A frequent plant in many localities where "birch" does not grow. Sometimes it is red-zoned. Usually it is the host of a minute species of greenish algae, which colors the pileus. Rarely I have received a beautiful, striate form that has been mentioned by Prof. Peck.

Lenzites sepiaria.—This is a common species, but always on pine and other coniferous trees. The name is well established and generally used. Sometimes it takes a polyporoid form, or rather condition, I think. It can readily be recognized by its color.

Lenzites trabea.—This is readily recognized from the habitat, as it always grows on deciduous wood. I learned it under the name Lenzites vialis, which has been mostly used in the United States. Daedalea pallido-fulva is said to be the same. European mycologists to whom I have sent the plant are in accord that it is Lenzites trabea of Europe, a statement that has recently been disputed. I do not know.

Panus rudis.—A frequent plant in the United States; a rare plant in Europe. It generally passed in American mycology under the name Lentinus Lecomtei until the error was pointed out (Myc. Notes, p. 60).

Polyporus adustus.—A most abundant plant at Cincinnati on fallen beech. Very common everywhere, I think. I doubt if Polyporus fumosus is distinct. A fragrant form is called Polyporus fragrans. The same form occurs in Europe, but there it has not been thought worthy of a separate name.

Polyporus arcularius.—A very common plant around Cincinnati in the spring.

Polyporus Berkeleyi.—The largest polyporus we have, usually at the base of oak-trees. It does not grow in Europe.

Polyporus betulinus.—In birch regions a frequent plant and well named, for I think it is confined to the birch.

Polyporus brumalis.—This plant reaches me very often from correspondents, but I have never collected it at Cincinnati.

Polyporus elegans.—Frequent in northern stations (not at Cincinnati).

Polyporus giganteus.—As generally known in the United States, though now disputed. My American plants have been so referred in Europe.

Polyporus gilvus.—Very common and somewhat changeable. Widespread in the world, and tropical forms have received many names. Strange to say, it is not surely known from Europe, though Fries claims to recognize it as one of Sowerby's pictures.

Polyporus intybaceus.—It has always been a puzzle to me whether this is Polyporus intybaceus or Polyporus frondosus, or whether these two are the same or different. Atkinson gives a good photograph of it under the former name. It is Polyporus anax of Morgan's flora, but Polyporus anax, the type, is Polyporus Berkeleyi.

Polyporus lucidus.—The correct genus to which this plant belongs is now known as Ganoderma, consisting of species with "varnished" pilei and colored spores. Most of them, I think, are better called Fomes, but this species with us is not perennial, hence not properly a Fomes. It is therefore a question whether to call it Polyporus lucidus, Fomes lucidus or Ganoderma lucidus. It has been known, however, under the specific name "lucidus" for more than a hundred years, and it is purely chimerical to try to change that.

Polyporus nidulans.—Rather a rare plant in my experience. A curious fact that is not generally known is a "chemical" test for it. Touch it with a drop of ammonia, and the spot at once takes a bright violaceous color.

Polyporus obtusus.—Frequent and injurious on oak. A marked species with large pores. The late Professor Ellis told me it could be found in Schweinitz's herbarium under the name Polyporus unicolor, which I confirmed. Schweinitz badly described it, and gave it a worse name. When one has a choice between two names for a plant, one very good, the other very bad, and neither much used, I believe in adopting the better. Of more interest than the name, however, is the structure of the plant, for it is a *Trametes*, not a Polyporus.

Polyporus picipes.—As I have always known it in the United States. Claimed now to be different from the European plant, which, if true, is unfortunate, as Polyporus picipes is an excellent name for it.

Polyporus resinosus.—Usually known under this name as found in Fries, though I believe modern excavators have dug up older names for it. Very common at Cincinnati.

Polyporus sulphureus.—So called for many years and much the best name that can be applied to it. Common, late in the season.

Polystictus conchifer.—A most peculiar species, named by Schweinitz. It occurs only on elm, and does not grow in Europe.

Polystictus hirsutus.—A very common and a very variable plant. Around Cincinnati it is quite uniform, but many forms (?) reach me, and I do not know but that I am confusing more than one species.

Polystictus perennis.—A frequent species growing in the ground. A form in the Southern States has larger pores, and is known as Polystictus parvulus. I doubt if it can be kept distinct.

Polystictus pergameus.—A very common plant in the United States, usually growing on oak. It is claimed that as the original grew on pine it is not the same as the common species in the United States, and the name Polystictus pseudo-pergameus has been proposed. However, the plant is generally known as Polystictus pergameus. It is a curious fact that this is a very rare plant in Europe, and it was recently brought into the museum at Paris as a great rarity. It is called in France "Polystictus simulans, Blonski."

Polystictus sanguineus.—This is the bright-red species of the Southern States, and is close to Trametes cinnabarinus (which see). It is common throughout the warm regions of the world.

Polystictus versicolor.—The most frequent Polystictus that occurs and the most variable. New species hunters are wasting their opportunities. They should devote themselves to this plant, for they can make a "new species" out of every specimen they collect.

Trametes cinnabarinus.—The only *red* polyporoid in the northern United States. It is a question whether it should be called Trametes or Polystictus, and it is given both names in Saccardo. (Cfr. Polystictus sanguineus.)

Schizophyllum commune.—A very common species all over the world and in every country, hot and cold, where I have ever been. At Cincinnati it has a special liking for the maple. It has been known as "commune" for two generations, but recent date dictionary investigators have called it Schizophyllum alneum, in my opinion a stupid change for a plant that *is* the most *common* species, that occurs everywhere, and grows in many countries and thousands of localities where alder does not grow.

Stereum albobadium.—A very common plant at Cincinnati, but does not occur in Europe, I think. The margin is generally so slightly recurved it is more liable to be taken for a Corticium.

Stereum frustulosum.—If this plant does not have another generic name it ought to have. One who is familiar with other stereums would never suspect its relation to that genus.

Stereum ochraceoflavum.—It is of a Southern type. Common in Florida, but I have received it from New Jersey and once from Connecticut.

Stereum versicolor.—As I have always known the plant and as it is generally known. I think Professor Burt told me he had decided to call it another name, but I have forgotten what it is.

THE MYCOLOGICAL SITUATION IN AMERICA.

I have to write so many letters to my correspondents in reply to inquiries as to what literature to buy in order to study mycology that I feel it will save time to issue a printed letter on the subject.

Unfortunately there is no one book of much service. I always advise my correspondents to first buy Atkinson's "Mushrooms, Edible, Poisonous, etc." It is the best book we have. It is only a primer and does not consider one out of twenty of the agarics you will meet every season, but you can derive from it a general idea of classification. It is a difficult matter to get a "start" in American mycology, and I have reason to know that Atkinson had a hard enough time to learn what he knew at the time he wrote the book. So I believe he should have all praise for what he has done, not hiding the fact that there is a great deal of room to do much better as he learns more of the subject.

The next book of service is Miss Marshall's "Mushroom Book," chiefly on account of the pictures which are much better than the text. Like the preceding it is purely elementary and considers only a few common species.

Dr. Herbst's "Fungal Flora of the Lehigh Valley," Pennsylvania, is a very useful book because it considers many common plants that every one will meet. Unfortunately the illustrations are very poor.

When you have begun to get an insight into the genera, buy Stevenson's "British Fungi." It is chiefly a translation of Fries, but it is all the more valuable on that account. Fries was the great master of agarics in Europe, and universally held to be the best authority, but his writings are in Latin, and while they are the court of final resort, you will not need them until you reach the "new species" stage.

Massee's "British Fungus Flora," four volumes, is the latest English work and is largely used in England. The arrangement of the genera departs from all other works and it is so difficult to find anything in it that I rarely use it. It always reminds me of a house I saw on the Midway where everything was upside down.

The fungi of Europe and America are for the most part the same species, and thus any European work will be of service in America. It is my firm belief that the greater part of the plants in America that have been described as new species, are European plants not recognized. Failure to identify the American plants from the conflicting accounts and illustrations that have been given of them in Europe is to no man's discredit. To reach conclusions when working with agarics in Europe is a task difficult enough: in America it is impossible. If American mycologists had any practical way of learning the American names for the agarics they meet it would be a great help. There is but one man, in my opinion, to-day, who has a practical field knowledge of most American agarics and who could write a manual that would be of real benefit. That man is Professor Charles Peck, of New York. Most of his past time has been spent in issuing isolated descriptions. They are of very little service, and it is my experience in America that about two out of three plants one meets agree with the descriptions just enough so that one thinks it may be the species, and differ just enough so that one doubts it. So that you are in a more uncertain position when you finish your determination than when you began it. This is the fault of the way in which the matter is presented. Professor Peck knows the New York plants and could write *systematic* work, presenting the plants by *constrast* and pointing out the differences between them so that they could be recognized. I think I reflect the wish of every American mycologist when I express the hope that he may undertake *A Manual of New York Agarics*. I use the word "New York" because it is the New York species that Professor Peck knows, and fungi are such widely spread plants that it would serve as a manual for the entire country. American mycology is embarrassed with a lot of "dried specimen" descriptions of agarics which for the most part are rubbish and should be crossed off the "literature." It is impossible for a man to draw up live characters from dead plants that lose the most of their real characters in drying. Such work only confuses the facts and should be ignored in any work that wishes to be of real service.

There is no series of plates illustrating the agarics of America. Such as have been issued in the New York Reports are poor and of but little utility. In Europe there are many illustrated works, so badly executed they help but little. Boudier's magnificent plates unfortunately include but very few agarics. Boudier's special study is the little Pezizas, a specialty of very little general interest. If he had devoted his talents to the agarics and issued six hundred plates of European agarics it would have been a practical solution of the agaric situation. And it would have been a popular work and have had a large sale. Nine out of ten mycologists are interested in agarics, and every one knows how poor the usual plate is.

Not counting Boudier, the best illustrations of the agarics of Europe in my opinion are the old works of Bulliard, Sowerby, and Greville, and in the Flora Danica. The most useful series is Cooke's plates because it embraces all common species and for the most part is fairly well done. If you have funds to buy but one series of illustrations, buy Cooke's. They cost about one hundred dollars. With all Cooke's faults, he did a great deal to popularize mycology in England, and I wish we had a Cooke in America.

Many years ago in Professor Gray's time, it was announced that the cryptogams of America would be worked up by Professor Farlow. It is an open secret that some excellent plates have been prepared under Professor Farlow's directions, but whether or not they will ever be published I do not know. We can only live in hope.

But all this is departing from the Polyporus subject. Favor me by sending such specimens as you find this season and I will advise you what I may know about them, and will try to learn more, and in time hope to present a work that will enable you to learn for yourself.

C. G. LLOYD,

Court and Plum Streets,

Cincinnati, Ohio.

LETTER No. 11.

Paris, June, 1906.

List of specimens received from the United States and Canada during the season of 1905. For general remarks on the names, see Letter No. 10 of this date. We list here only the specimens we recognize. (In a few instances the names were furnished by the senders.) We have received quite a number of other specimens, Pezizas, Xylarias, and some Polyporii, etc., that we do not know, and these are all omitted from this list.

AMES, FRANK H., New York:

Polystictus versicolor, **Schizophyllum** commune, **Trametes** cinnabarinus.

BAKER, C. H., Florida:

(Genus unknown to me.)

BATES, REV. J. M., Nebraska:

Cyathus stercoreus, **Irpex** tulipifera, **Scleroderma** Texense, **Tylostoma** campestre.

BERTOLET, A. S., Alabama:

Clavaria pistillaria.

BERTOLET, A. S., Ontario:

Fomes carneus.

BOGUE, E. E., Michigan:

Geaster saccatus, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Lycoperdon** Turneri, **Morchella** esculenta, **Scleroderma** Cepa.

BRENCKLE, J. F., North Dakota:

Calvatia (the largest sterile bases I ever saw, one six inches in diameter, eight inches high, I think probably Calvatia caelata), **Cyathus** stercoreus, **Lycoperdon** cepaeforme, **Mycenastrum** Corium.

BURGIN, CAROLINE A., New York:

Mitremyces cinnabarinus (the most northern station, I think, for this species).

BURNHAM, STEWART H., New York:

Lycoperdon gemmatum, **Lycoperdon** piriforme, **Panus** rudis.

CARTER, L. W., South Dakota:

Calvatia lilacina, **Calvatia** occidentalis, **Catastome** subterraneum, **Cyathus** stercoreus, **Geaster** asper, **Lycoperdon** cepaeforme, **Lycoperdon** cruciatum, **Lycoperdon** Wrightii, **Mycenastrum** Corium, **Secotium** acuminatum, **Trametes** Peckii.

UNIVERSITY OF CALIFORNIA
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CHESTER, F. D., Delaware:

Lycoperdon cruciatum, **Lycoperdon** gemmatum, **Lycoperdon** Turneri.

CHESTER, F. D., Ithaca, N. Y.:

Tylostoma campestre (?)

CLARKE, JAMES F., Iowa:

Hypomyces lactifluorum, **Lentodium** squamulosum.

CLUTE, W. N., Illinois:

Bovista pila, **Bovista** plumbea, **Daedalea** unicolor, **Favolus** europaeus, **Lycoperdon** piriforme, **Lycoperdon** tessellatum, **Lycoperdon** umbrinum, **Panus** stipticus, **Polyporus** gilvus, **Polystictus** hirsutus, **Polystictus** versicolor, **Trametes** trabea, **Urnula** Craterium.

CREWE, DR. J. E., Minnesota:

Bovista pila, **Crucibulum** vulgare, **Cyathus** Schweinitzii, **Daldinea** vernicosa, **Fomes** carneus, **Geaster** saccatus, **Lycoperdon** echinatum, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Nidularia** pisiformis (a very rare plant both in the United States and Europe), **Peziza** floccosa, **Peziza** occidentalis, **Polyporus** elegans, **Polyporus** obtusus, **Scleroderma** Cepa, **Scleroderma** tenerum, **Stereum** versicolor, **Schizophyllum** commune, **Trametes** cinnabarinus, **Trametes** trabea.

DALLAS, MRS. GEO. M., Philadelphia, Pa.:

Bulgaria rufa, **Craterellus** connucopioides, **Daedalea** confragosa, **Daedalea** Kansensis, **Humaria** sanguinaria, **Hydnum** septentrionale, **Hydnum** suaveolens, **Hydnum** subsquamosum, **Irpex** cinnamomea, **Irpex** tulipifera, **Lentinus** vulpinus, **Lenzites** betulina, **Lenzites** corrugata, **Lenzites** sepiaria, **Lenzites** trabea, **Peziza** macropus, **Polyporus** varius, **Rhizopogon** rubescens, **Trametes** funalis (evidently exotic). The specimens were mostly determined by Professor Ellis.

DAVIS, SIMON, Massachusetts:

Bovista plumbea, **Cordyceps** ophioglossoides, **Elaphomyces** variegatus.

DEARNESS, J., Canada:

Cordyceps ophioglossoides, **Elaphomyces** variegatus, **Tuber** (which I have sent to Professor Mattirolo, Italy, our best authority now on the Tuberaceae, and which he says is undescribed; also that he will publish it shortly in a paper he is now writing on the American species).

DOBBIN, FRANK, New York:

Fomes leucophaeus, **Fuligo** septica, **Irpex** lacteus, **Lenzites** betulina, **Panus** stipticus, **Polystictus** hirsutus, **Polystictus** versicolor, **Trametes** cinnabarinus.

DORNER, H. B., Indiana:

Fomes leucophaeus, **Hydnum** erinaceum, **Polyporus** frondosus, **Polystictus** versicolor.

DUBOIS, P. A., California:

Bovistella (I think new to me. It has a very thin peridium, but in general appearance is more like a *thin* Bovista than a Bovistella. The capillitium is evidently of the *separate type*, but long, slender, intertwined branches. The spores are 4-5 mic., smooth, apiculate, but not pedicellate).

DUPRET, H., Canada:

Cantherellus floccopus, **Cantharellus** infundibuliformis, **Helvella** crispa, **Lenzites** sepiaria, **Lenzites** sepiaria (abnormal), **Polyporus** elegans, **Polyporus** lucidus, **Polystictus** pergameus, **Scleroderma** tenerum.

EASTWOOD, ALICE, California:

Bovista (provisionally occidentalis). A form evidently of Bovista pila, but the first time any form of this species has reached me from the extreme Pacific Coast. **Calvatia occidentalis.**

ELY, E. P., Minnesota:

Bovista pila, **Daldinea** concentrica, **Fuligo** septica, **Lycoperdon** cepaeforme, **Polyporus** obtusus.

ERNST, FLORA G., South Dakota:

Lycoperdon cruciatum, **Lycoperdon** nigrescens.

FLETCHER, JAMES, Canada:

Polystictus perennis, **Scleroderma** aurantium, **Sclerotium** (the first time I have seen it. Somewhat similar, but very different from "Tuckahoe" of the Southern States.

FRYE, PROFESSOR T. C., Washington:

Nidula microcarpa; also what I take for a large form of it, although the cups are much larger than usual.

GARMAN, PROFESSOR H., Kentucky:

Bovistella Ohiensis.

GLATFELTER, DR. N. M., Missouri:

Daedalea ambigua, **Daedalea** confragosa, **Daedalea** quercina, **Daedalea** unicolor, **Favolus** europaeus, **Fomes** Curtisii, **Fomes** Everhartii, **Fomes** fraxinophilus, **Fomes** leucophaeus, **Fomes** lucidus, **Hydnum** adustum, **Hydnum** coralloides, **Hydnum** pulcherrimum, **Irpex** pachylon, **Lentinus** lepideus, **Lentinus** tigrinis, some of them taking the form Lentodium squamosum, **Lentinus** ursinus, **Lenzites** betulina, **Lenzites** sepiaria, **Lenzites** trabea, **Panus** rudis, **Polyporus** adustus, **Polyporus** arcularus, **Polyporus** Berkeleyi, **Polyporus** biennis, **Polyporus** conchoides, **Polyporus** epileucus, **Polyporus** fumosus (these seem well distinct from adustus), **Polyporus** giganteus **Polyporus** gilvus, **Polyporus** humilis, **Polyporus** intybaceus, **Polyporus** lacteus, **Polyporus** obtusus, **Polyporus** picipes, **Polyporus** radicatus, **Polyporus** resinosus, **Polyporus** sulphureus, **Polystictus** conchifer, **Polystictus** hirsutus, **Polystictus** perennis, **Polystitcus** pergameus, **Polystictus** versicolor, **Trametes** cinnabarinus, **Trametes** Peckii. Several of these plants were not familiar to me, and I have recorded them by the names as given by Dr. Glatfelter.

HAMNER, C. C., Connecticut:

Mitremyces cinnabarinus.

HARPER, EDWARD T., Illinois:

Geaster Archeri, **Geaster** saccatus, **Geaster** triplex, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Scleroderma** flavidum.

HERRICK, GLEN W., Mississippi:

Lepiota Morgani.

HEWITT, J. L. Arkansas:

Polysaccum tubercsum. This species (or form) is rare.

HIGHAM, ADDIE, Michigan:

Panus levis.

HILL, A. J., Canada:

Fomes carneus, **Fomes** leucophaeus, **Geaster** triplex, **Polyporus** adustus (? form), **Polystictus** versicolor.

HOWELL, GEO. T., Indiana:

Peziza coccinea.

HRDLICHA, A., Washington, D. C.:

Bulgaria rufa, **Calocera** cornea, **Crucibulum** vulgare, **Daedalea** quercina, **Hydnum** adustum, **Hydnum** erinaceum, **Lenzites** sepiaria, **Lycogala** epidendrum, **Merulius** tremulosus, **Panus** rudis, **Peziza** floccosa, **Polyporus** picipes, **Polystictus**, perennis, **Polystictus**, pergameus, **Polystictus** versicolor, **Schizophyllum** commune, **Scleroderma** Geaster, **Spumaria** album, **Stereum** frustulosum.

HUNT, MRS. D. O., California:

Bovista plumbea, **Calvatia** occidentalis, **Geaster** giganteus, **Geaster** hygrometricus, **Lycoperdon** excoriatum, **Lycoperdon** gemmatum, **Lycoperdon** subpratense.

HUNT, MRS. CLARA A., Victoria, B. C.:

Bovista pila.

JONES, MISS KATE A., New Hampshire:

Bovista pila, **Daedalea** confragosa, **Daedalea** unicolor, **Daldinea** concentrica, **Fomes** carneus, **Fuligo** septica, **Lenzites** sepiaria, **Lycoperdon** atropurpureum, **Lycoperdon** cepaeforme, **Lycoperdon** cruciatum, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Lycoperdon** subincarnatum, **Panis** rudis, **Polyporus** elegans, **Polyporus** lucidus, **Polystictus** hirsutus, **Polystictus** perennis, **Polystictus** pergameus, **Polystictus** versicolor, **Schizophyllum** commune, **Trametes cinnabarinus.**

KENNEDY, P. B., Lake Tabor, Cal.:

Catastoma luteolum. This has the general appearance of being yellow specimens of Bovista plumbea (if yellow specimens occurred), but the internal structure is that of a Catastoma. The exoperidium is quite different from that of all other American Catastomas, being thin and of the nature of the cortex of Bovista plumbea. Gleba bright olive. Spores 6 mic., globose, smooth, apiculate, Capillitium typically that of a Catastoma, short, unbranched threads, 3 mic. thick. They are pale yellow in a water mount, but appear hyaline in lactic acid. The plant is very close to Catastoma hypogaeum of Australia, which, however, has rough spores.

KENNEDY, P. B., Nevada:

Cyathus vernicosus.

KNAEBEL, ERNEST, Colorado:

Crucibulum vulgare, **Lycoperdon** gemmatum in several puzzling forms, **Lycoperdon** piriforme, **Lycoperdon** umbrinum.

LAKE, E. R., Oregon:

Lycogala epidendrum.

LANGTON, THOMAS, Canada:

Daedalea unicolor, **Guepinia** rufum (a beautiful specimen, and the first time I have ever seen the species), **Lentinus** lepideus, **Lenzites** sepiaria,

Panus stipticus **Polyporus** adustus, **Polyporus** brumalis, **Polyporus** elegans, **Polyporus** gilvus, **Polyporus** nidulans, **Polyporus** radiatus, **Polystictus** hirsutus, **Polystictus** pergameus, **Polystictus** versicolor, **Schizophyllum** commune, **Scleroderma** aurantium.

LAUGHLIN, EMMA E., Ohio:

Craterellus cantharellus, **Fomes** leucophaeus, **Irpex** lactus, **Merulius** incarnatus (a rare and beautiful species), **Stereum** spadiceum.

LEHMAN, E. A., North Carolina:

Favolus europaeus, **Hydnum** adustum, **Hydnum** erinaceum, **Mitremyces** cinnabarinus, **Pleurotus** nidulans, **Polyporus** obtusus, **Scleroderma** Geaster.

MACKINTOSH, R. B., Massachusetts:

Bovistella Ohiensis, **Crucibulum** vulgare, **Daedalea**, confragosa, **Daedalea** quercina, **Favolus** europaeus, **Geaster** hygrometricus, **Lycoperdon** cruciatum, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Lycoperdon** tessellatum, **Lycoperdon** Turneri, **Lycoperdon** Wrightii, **Polyporus** brumalis, **Polystictus** conchifer, **Polystictus** hirsutus, **Polystictus** pergameus, **Reticuaria** Lycoperdon (two of these puff-balls are here recorded for the *first time* from the New England States), **Scleroderma** aurantium, **Scleroderma** tenerum, **Scleroderma** verrucosum, **Secotium** acuminatum, **Tremellodon** gelatinosum, **Urnula** Craterium.

McGOWAN, H. G., Mississippi:

Bovistella Ohiensis ("this is a common puff ball in the cotton-fields in this section"), **Fomes** reniformis (since I have become acquainted with Fomes applanatus in Sweden, I am quite sure that Fomes reniformis is not the same, as I was advised (Cfr. Myc. Notes, p. 60), **Geaster** hygometricus, **Lenzites** betulina, **Mitremyces** Ravenelli (an interesting new locality for this species), **Polyporus** gilvus, **Polysaccum** tuberosum, **Polystictus** sanguineus, **Polystictus** versicolor, **Stereum** versicolor, **Trametes** incanus.

McILVAINE, CHARLES, Maryland:

Fomes Curtisii, **Hydnum** adustum, **Thelephora** Schweinitzii.

MONTGOMERY, C. E., New Hampshire:

Daedalea unicolor, **Stereum** purpureum, **Stereum** spadiceum.

MORRIS, GEO. L., Massachusetts:

Boletinus cavipes, **Boletinus** paluster, **Cordyceps** militaris, **Geaster** triplex, **Geoglossum** hirsutum, **Hypoxylon**, Howeianum, **Morchella** esculenta, **Peziza** ancilis, **Peziza** badia, **Polyporus** ovinus, **Polystictus** cinnabarinus, **Sparassis** crispa, **Spathularia** flavida, **Thelephora** terrestris, **Tremella** mycetophila. Mostly named by Mr. Morris, and several of them not familiar to me.

NEAD, MRS. J. D., Missouri:

Calvatia gigantea.

NELSON, N. L. T., Missouri:

Hymenochaete Curtisii, **Lycoperdon** piriforme, **Polyporus** nidulans, **Polystictus** hirsutus, **Polystictus** versicolor **Stereum** frustulosum, **Stereum** versicolor.

NOBLE, MRS. M. A., Florida:

Cyathus stercoreus, **Fomes** Curtisii, **Geaster** hygrometricus, **Scleroderma** Geaster, **Tylostoma** Floridanum.

PAULL, LESTER F., Massachusetts:

Fomes leucophaeus.

PERRINE, LURA L., North Dakota:

Cyathus Schweinitzii (it is not generally known that the plant commonly called "Cyathus striatus" has a quite different "tunica" from the species of Europe. Tulasne called the American form "var. Schweinitzii."), **Cyathus** vernicosus.

RICKER, P. L., Washington, D. C.:

Specimen received under the name "Bjerandera robiniophila." It seems to us we have seen the name or something similar in Scandinavian literature.

ROLFS, P. H., Florida:

Polyporus gilvus, **Polystictus** pinsitus, **Polystictus** sanguineus, **Trametes** hydnoides.

SCHRADER, FRED J., Washington, D. C.;

Rhizina inflata. (We have collected this curious plant in Sweden, but did not know of its occurrence in the United States.)

SCHUMO, S. S., Philadelphia, Pa.:

Bovista nigrescens (collected in Switzerland). Had Mr. Schumo not advised me the locality I should have been truly puzzled, for Bovista nigrescens is unknown in America.

SEWALL, MARGARET L., New Hampshire:

Daedalea unicolor, **Fomes** carneus, **Fomes** leucophaeus, **Hydnum** caput-ursi, **Polyporus** brumalis, **Polyporus** radiatus, **Polystictus** perennis, **Polystictus** pergameus, **Polystictus** versicolor, **Tremellodon** gelatinosum.

SMITH, THEODATE L., Worcester, Mass.:

Irpex, paradoxa, **Lenzites** betulina, **Lenzites,** Klotzschii, **Lenzites** sepiaria, **Polyporus** fumosus, **Polyporus** Schweinitzii, **Polystictus** hirsutus, **Stereum** complicatum, **Stereum** ochraceoflavum, **Stereum** purpureum.

SPAULDING, Perley, Mo.:

Crucibulum vulgare, **Daedalea** ambigua, **Favolus** europaeus, **Geaster** saccatus, **Polyporus** gilvus, **Stereum** albobadium.

STERLING, E. B., New Jersey:

Arachnion album, **Cyclomyces** Greeni (a very rare plant, which has probably never been collected more than a dozen times. Professor Peck records it twice, I think, and Dr. Herbst found it once. Mr. Sterling's specimens are the finest we have ever seen), **Daedalea** confragosa, **Daedalea** quercina, **Fomes** leucophaeus, **Fomes** rimosus, **Hydnum** ochraceum, **Hypomyces** lactifluorum, **Irpex** cinnamomeus, **Irpex** tulipifera, **Kneiffia** setigera, **Lentodium** squamosum, **Lenzites** betulina, **Lenzites** lepideus, **Mitremyces** cinnabarinus (? old), **Panus** stipticus, **Peziza** badia, **Polyporus** Berkeleyi, **Polyporus** betulinus, **Polyporus** giganteus, **Polyporus** gilvus, **Polystictus** conchifera, **Polystictus** hirsutus, **Polystictus** pergameus, **Polystictus** versicolor, **Schizophyllum** commune. **Stereum** ochraceoflavum.

STERLING, E. B. (From his son at Dawson, Yukon):

Catastoma (unknown to me), **Lycoperdon** gemmatum, also a globose form of it, which does not occur in the United States.

STEVENS, ROLLIN H., Michigan:

Helvella Stevensii (co-type).

STILES, J. W., Texas:

Arachnion album, **Holocotylon** Texense (cfr. Myc. Notes, p. 255, plate 73). (Mr. Stiles writes me: "These two plants resemble each other very much in external appearance and habits of growth. They were collected within fifty yards of each other, but in entirely different groups and unmixed") **Geaster** saccatus (or rather a form intermediate between this species and G. triplex), **Scleroderma** tenerum.

STONE, G. E., Massachusetts:

Mitremyces cinnabarinus.

SUKSDORF, W. N., Washington:

Lycoperdon atropurpureum, **Lycoperdon** cepaeforme, **Lycoperdon** gemmatum (many forms), **Lycoperdon** glaciale (undescribed), **Lycoperdon** piriforme, **Lycoperdon** subpratense (the first with a cortex I have seen from the United States), **Rhizopogon** (two collections).

TRASK, MRS. BLANCHE, California:

Battarrea Stevenii, **Geaster** minimus.

WALDRON, L. R., North Dakota:

Calvatia caelata, **Catastoma** subterraneum, **Geaster** mammosus (rarely received), **Lycoperdon** cepaeforme, **Lycoperdon** cruciatum, **Secotium** acuminatum, **Tylostoma** Americanum (?).

Daedalea unicolor, **Irpex** lactea, **Lenzites** betulina, **Lenzites** sepiaria, **Panus** rudis, **Polyporus** elegans, **Polystictus** hirsutus, **Polystictus** perennis, **Polystictus** pergameus, **Polystictus** versicolor, **Schizophyllum** commune, **Stereum** versicolor, **Trametes** cinnabarinus.

WALTON, F. J., New Jersey:

Fomes Curtisii.

WARNER, H. E., New Hampshire:

Bovista pila, **Cantharellus** floccopus, **Cyathus** vernicosus, **Daedalea** unicolor, **Fomes** fomentarius, **Fomes** leucophaeus, **Lenzites,** sepiaria, **Polyporus** betulinus, **Polystictus** hirsutus, **Polystictus** perennis, **Polystictus** versicolor, **Trametes** cinnabarinus.

WATSON, DR. L. H. Illinois:

Clitocybe Picuna (type), **Favolus** europaeus, **Geaster** triplex, **Panus** rudis, **Polyporus** arcularius, **Polyporus** picipes, **Polystictus** pergameus, **Trametes** cinnabarinus.

WELD, LEWIS H., New York:

Daedalae confragosa, **Daedalea** unicolor, **Fomes** conchatus, **Fomes** leucophaeus, **Fomes** Novae-Angliae (?), **Fomes** pinicola, **Fomes** rimosus, **Irpex** tulipifera, **Lenzites** betulina, **Lenzites** sepiaria, **Panus** stipticus, **Polyporus** adustus, **Polyporus** gilvus, **Polyporus** lucidus, **Polyporus** picipes, **Polyporus** sulphureus, **Polystictus** hirsutus, **Polystictus** pergameus, **Polystictus** versicolor, **Poria** cruentata, **Schizophyllum** commune, **Stereum** versicolor, **Trametes** cinnabarinus.

WHETSTONE, DR. MARY S., Minnesota:

Crucibulum vulgare, **Cyathus** vernicosus, **Favolus** europaeus, **Lenzites** sepiaria, **Polyporus** gilvus, **Scleroderma** tenerum, **Whetstonia** strobiliformis. The latter is a strange fact, that an unknown genus should be discovered in such a well-known field. The plant will be illustrated in Mycological Notes, Plate 90.

WOLFERT, MRS. ALBERT J., Ohio:

Cyathus stercoreus, **Daedalea** unicolor, **Daldinea** concentrica, **Lenzites** betulina, **Polystictus** pergameus.

YATES, LORENZO G., California:

Calvatia pachyderma (oval spored form).

LETTER No. 12.

Paris, June, 1906.

List of specimens received from Europe and foreign countries since the publication of the last list, February, 1906. We beg to thank our correspondents for the specimens received. Excepting from Europe and the United States, the "puff balls" of the world are very little known, and I feel that more has been learned from the specimens received by me in the last few years than was previously known on the subject. It is a big world and many puff balls occur, and we are gradually learning more and more about them. If our friends who receive our publications will pick up and send such specimens as they notice we shall have in the end a general knowledge of the subject, and the species will be published and illustrated in a systematic manner.

The postal laws of France are very liberal regarding the exchange of packages from other countries, and specimens can be sent by package post at slight cost. That is one reason why I make my headquarters at Paris.

Respectfully,

C. G. LLOYD,

107 Boulevard St. Michel, Paris, France.

ACLOQUE, A., France:

Bovista plumbea, **Lycoperdon** spadiceum.

de ARANZADI, PROF. T., Spain:

Calvatia cælata, **Clathrus** cancellatus, **Lycoperdon** atropurpureum, **Lycoperdon** cruciatum, **Lycoperdon** gemmatum, **Rhizopogon** rubescens, **Scleroderma** Geaster.

ARNOULD, LEON, France:

Elaphomyces granulatus.

BLANDENIER, A. (From Mariut, limit of the Libyan desert.):

Terfezia Boudieri.

BRAUN, DR. K., German East Africa:

Cyathus Poeppigii, **Lycoperdon** Wrightii (The discovery of this American species in Africa is of interest. It does not occur in Europe), **Scleroderma** verrucosum.

COBB, N. A., Hawaii:

Lycoperdon pusillum.

CRADWICK, WM., Jamaica:

Auricularia auricula-Judæ, **Cyathus** limbatus, **Lentinus** villosus.

CRUCHET, DENIS, Switzerland:

Bovista nigrescens, **Calvatia** cælata, **Scleroderma** verrucosum.

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DAMAZIO, L., Brazil:

Calvatia lilacina, **Schizostoma** commune.

DUNN, MISS JESSIE, New Zealand:

Cyathus vernicosus, **Geaster** saccatus (tending toward Englerianus), **Lycoperdon** (a freak, consisting entirely of sterile cells), **Lycoperdon** pratense, **Secotium** erythrocephalum (spores 8x16, in those previously received they are stated to be 6x12), **Polyporus** (cfr. arcularius).

EARLE, F. S., Cuba:

Calvatia lilacina, **Cyathus** Earlei (type), **Cyathus** intermedius, **Lycoperdon** (sp.).

HARIOT, P., France:

Peziza corona.

HARIOT, P., (from Algeria):

Terfezia Leonis.

HARIOT, P., (from New Caledonia):

Auricularia polytrichum, **Fomes** senex, **Ganoderma** australe, **Ganoderma** Pisachopani, **Ganoderma** rugosa, **Lenzites** repanda, **Polyporus** scruposus, **Polystictus** elongatus, **Polystictus** hirsutus, **Trametes** Persoonii.

HARRIS, WM., Jamaica:

Cyathus limbatus (a very abundant collection), **Cyathus** pallidus (a few specimens mixed with limbatus), **Lycoperdon** gemmatum.

HEMET, L., France:

Lycoperdon piriforme, **Lycoperdon** pratense.

HIGGINS, J. E., Hawaii:

Scleroderma (cfr. verrucosum).

JAMES, HENRY SPENCER, Australia:

Clathrus gracilis (in alcohol).

JEKYLL, WM., Jamaica:

Cyathus sphærosporus (type), **Cyathus** stercoreus, **Geaster** saccatus, **Laternea** pusilla.

KIRTIKAR, COL. K. R., Bombay Presidency, India:

A fine collection of **Calvatia** lilacina as it grows *in every country in the world.*

KRUEGER, PROF. W., Germany:

Bovista nigrescens, **Lycoperdon** cruciatum, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Lycoperdon** piriforme (a lacunose form), **Lycoperdon** spadiceum, **Rhizopogon** rubescens.

KUSANO, S., Japan:

Bovistella (undescribed), **Lycoperdon** gemmatum, **Lycoperdon** piriforme (form), **Lycoperdon** (cfr. spadiceum), **Scleroderma** verrucosum.

LEWTON-BRAIN, L., Barbados:

Scleroderma Geaster (a very small form that seems to occur only in the West Indies).

LUDWIG, L., France:

Elaphomyces asperulus (showing the asci which can only be seen in young specimens of Elaphomyces), **Elaphomyces** cyanosporus, **Fomes** annosus, **Fomes** Euonymii, **Fomes** fraxineus, **Trametes** pini, **Trametes** serialis, **Trametes** trabea.

MACHARDO, M. A. D., Perak, Straits Settlement:

Auricularia auricula-Judæ, **Ganoderma** australe, **Ganoderma** testaceus, **Hexagona** albida (Lenzites form), **Lentinus** blepharodes, **Lentinus** dactyliophorus, **Polyporus** auberianus, **Polyporus** cingulatus, **Trametes** cinnabarinus, **Trametes** lutescens, **Trametes** Muelleri, **Trametes** Persoonii, **Trametes** versatilis. (These plants, belonging to families I have not as yet studied, were named by Professor Patouillard.)

MILLEN, H., Tobago, West Indies:

Lentinus villosus, **Lenzites**, applanatus.

NAVAS, REV. L., Spain:

Cyathus vernicosus, **Lycoperdon** cepæforme, **Lycoperdon** pusillum, **Lycoperdon** subvelatum (the first time I have received it from Europe).

O'CONNOR, CHAS. A. O., Mauritius:

Cyathus (close to intermedius but I think not the same), **Cyathus** Poeppigii, **Lycoperdon** pusillum, **Scleroderma** patens (a new form of aurantium which opens like Scleroderma Geaster).

PAZSCHKE, DR. O., Dresden:

The specimens are from varied countries as named. BAVARIA: **Lycoperdon** piriforme. BELGIUM: **Cyathus** striatus. BRAZIL: **Lycoperdon** velutinum. GERMANY: **Geaster** Schmidelii, **Gautiera** graveolens. SAXONY: **Crucibulum** vulgare, **Cyathus** striatus, **Lycoperdon** gemmatum, **Scleroderma** Cepa, **Shpærobolus** stellatus, **Tylostoma** mammosum. SOUTH AFRICA: **Calvatia** candida (? sans sterile base), **Calvatia** lilacina, **Geaster** Englerianus, **Geaster** MacOwani (only known from South Africa. It is the same as Geaster fornicatus except it has a *sulcate mouth*), **Geaster** minimus, **Geaster** saccatus (form with a dark mouth), **Geaster** saccatus (typical), **Geaster** (unnamed as yet. We have seen the same plant at Berlin labeled "Geaster granulosum, Fuckel," but that "species" is Geaster minimus, and the South African plant is much too large and much too granular to be included with minimus), **Myriostoma** coliformis, **Scleroderma** verrucosum (a form different from the European form). SWITZERLAND: **Geaster** fimbriatus, **Melanogaster** Broomeianus. TIROL: **Corticium** aurantiacum.

PIERRHUGUES, MONSIEUR, France:

Polyporus hispidus.

RICK, REV. G., Brazil:

Calvatia lilacina, **Calvatia** rubro-flava (the only collection I have ever seen except from the United States), **Cyathus** Montagnei, **Entonæma** lignescens, **Geaster** Harioti (recently listed by Rev. Rick as Geaster asper, also the plant referred to as Geaster Lloydianus, which name I think can not be used as the plant illustrated under the name is not the plant so referred in the text), **Geaster** Javiacus (= Geaster Lloydii, Myc. Notes, p. 50), **Geaster** pectinatus (a small form), **Geaster** saccatus and **Geaster** Englerianus and many intermediate, **Hydnangium** luteo-carneum (recently described by Bresadola), **Lycoperdon** acuminatum (spores *slightly rough*; they are smooth in all I have previously seen), **Lycoperdon** cruciatum, **Lycoperdon** (cfr. gemmatum), **Lycoperdon** juriensis, **Lycoperdon** piriforme, **Lycoperdon** velutinum, **Simblum** sphærocephalum, **Tylostoma** exasperatum.

SIMMONDS, J. H., Australia:

Cyathus Poeppigii (Previously unrecorded from Australia, but that is not surprising as the Australian species have been very poorly worked).

TERRY, H. W., Hawaii:

Cyathus Earlei.

THIBOU, A., Antigua, West Indies:

Cyathus pallidus, **Cyathus** (close to limbatus but with narrow spores 6x20 mic.).

YASUDA, PROF. A., Japan:

Geaster hygrometricus, **Geaster** saccatus, **Lasiosphæra** Fenzlii (the first time ever collected except in British India and Ceylon), **Lycoperdon** gemmatum, **Polystictus** sanguineus.

YOSHINAGA, T., Japan:

Crucibulum vulgare, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Mitremyces** Ravenelii, **Nidula** (close to N. microcarpa and the first specimen of this genus known from Japan), **Scleroderma** tenerum.

LETTER No. 13.

Paris, September, 1906.

List of specimens received at Paris since the last report (June, 1906). My thanks are extended to all who have kindly sent specimens. As these plants reach me from the most remote and distant countries, it is gratifying to find that they are largely the same species and that the number of species is relatively few. I have made no actual count of the number of "puff balls" that I recognize as being good species, but as a guess I should say that three or four hundred, perhaps less, will cover them all. Many times that number have been proposed, but I think many were based on the inexperience of the authors or on slight differences that can not be maintained. The principal question now is the geography of the subject and the distribution of the species. We are gradually learning more in this regard and every specimen received adds to the knowledge. We hope those who receive our publications will continue to send such specimens as they note. No matter how common they may be, they aid in the work, and are all preserved in our museum.

ACLOQUE, A., France:

Calvatia caelata.

BAKER, R. T., Australia:

Polysaccum album. (I have questioned the validity of this "species," but from Mr. Baker's specimens I think it is good as far as species of this genus go. They are all dubious.)

BOTANICAL GARDEN, Peradeniya, Ceylon:

Geaster saccatus, **Geaster** subiculosum (which is only a large form of G. mirabilis), **Geaster** triplex. The latter is a form, new to me, with a somewhat scaly exoperidium.

BRACE, L. J. K., Bahamas:

Cyathus intermedius, **Geaster** velutinus (not typical, but tending toward saccatus), **Simblum** sphaerocephalum, **Thelephora** (Sp.).

BRIQUET, J., Dir. Jardin Bot., Geneva (Ex. Herb. Fayod.):

Favolus Europaeus, **Fomes** conchatus, **Polyporus** caesius, **Polyporus** fulvo-hirtus, **Polyporus** hirsutus, **Polyporus** lutescens, **Polyporus** placenta, **Poria** medulla-panis, **Trametes** abietina, **Trametes** odorata. (Specimens are listed as named in Herbarium Fayod.)

BROWN, ROBERT, New Zealand:

Clathrus cibarius, **Lycoperdon** gemmatum (a nice lot), **Scleroderma** verrucosum (I think, though mouldy and am not sure), **Sphaerobolus** epigaeus (if it is different from Sphaerobolus stellatus).

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DINTER, DR. KURT, German S. W. Africa:

Broomeia congregata, **Geaster** asper, **Geaster** fornicatus, **Geaster** saccatus. The first named is a curious genus, known only from South Africa. These are the first specimens of it I have ever received.

DONOR UNKNOWN, Congo, Africa:

Three species of **Xylaria**, unknown to me.

DUPAIN, VICTOR, Deux Sevres, France:

Queletia mirabilis. The *third time* that this rare plant has been found in France in forty years (Cfr. Myc. Notes, p. 185). Monsieur Dupain sends me specimens in various stages, showing how the stem is developed, heretofore unknown.

ELY, EDWARD P., Minnesota:

Catastoma subterranea.

FELIPPONE, DR. F., Argentina:

Scleroderma verrucosum.

GAMMIE, G. A., Poona, India:

Calvatia lilacina, **Cyathus** stercoreus.

GOTTINGER, DR., Austria:

Crucibulum vulgare.

GUILFOYLE, W. R., Australia:

Scleroderma Cepa(?).

HARIOT, P., Museum Crypt. Botany, Paris:

Elaphomyces granulatus (Creuse, France), **Fomes** resinaceus (Marne, France), **Polyporus** lucidus (Africa).

HARRIS, WM., Jamaica:

Lycoperdon pseudogemmatum (which is only a tropical form of **Lycoperdon** gemmatum).

HINSBY, GEO. K., Tasmania:

Lycoperdon piriforme. A very common plant in Europe and the United States, but of rare occurrence in Australasia. I have never received it from either Australia or New Zealand. Mr. Hinsby finds it in great abundance in Tasmania.

KLINCKSIECK, PAUL, Paris:

Daedalea quercina, **Fomes** ignarius, **Polyporus** lucidus. The following were collected in the mountain regions of France: **Bovista** nigrescens, **Fomes** pinicola, **Geaster** coronatus, **Lenzites** saepiaria, **Polystictus** hirsutus.

LAING, W. H., New Zealand:

Clathrus cibarius, **Cyathus** vernicosus, **Geaster** Drummondii, **Geaster** triplex, **Secotium** erythrocephalum (A nice collection of this beautiful species, which is only known from New Zealand and has never been collected even in Australia).

LUDWIG, L., Paris:

Elaphomyces Leveilleanum, **Fomes** nigrescens, **Polyporus** dryadeus (unknown to me from the United States), **Polyporus** lucidus, **Trametes** pini.

MASSALONGO, DR. C., Italy:

Cyathus Lesueuri (rare in Europe), **Cyathus** striatus, **Cyathus** vernicosus, **Geaster** triplex, **Lycoperdon** gemmatum, **Rhizopogon** rubescens, **Tylostoma** mammosa.

MILLE, REV. L., Ecuador:

Calvatia lilacina, **Lycoperdon** cruciatum, **Lycoperdon** polymorphum, **Lycoperdon** septimum (type), **Lycoperdon** Wrightii (first time noted from South America), **Schizophyllum** commune.

MILLEN, H., Tobago:

Cyathus Berkeleyanus. (The only time I have ever received this species.)

O'CONNOR, CHAS. A., Mauritius:

Lycoperdon endotephrum (Much more characteristic specimens than the types. An African species as far as known, and described in a few words as being Lycoperdon cruciatum *with a purple gleba.* I think that Lycoperdon djurensis is the same, probably described before the color change had taken place in the gleba), **Rhizopogon** (Sp.).

PANAU, CHAS., Verdun, France:

Daedalea biennis. A beautiful specimen, and I was particularly glad to get it as it is the first I have seen. The plant is usually referred to Daedalea by French botanists, following Persoon, though Fries put it in Polyporus.

READER, F. M., Australia:

Bovistella scabra, **Calvatia** lilacina, **Catastoma** anomalum, **Cordyceps** Gunnii, "**Fomes** rudis" (not a good Fomes in my opinion), **Hymenogaster** Moselei (?), **Lycoperdon** cepaeforme, **Polysaccum** pisocarpium, **Rhizopogon** (Sp.?) **Scleroderma** Cepa (?), **Scleroderma** flavidum.

RICK, REV. J., Brazil:

Blumenavia rhacodes (and a fine photograph of it, which will be published in Mycological Notes), **Calvatia** lilacina, **Cyathus** Montagnei, **Cyathus** Poeppigii (? sterile), **Cyathus** stercoreus, **Geaster** Englerianus, **Geaster** Hariotii, **Geaster** saccatus, "**Lanopila** guarantica" (The latter I suspect is only old Bovista bicolor), **Laternea** (close to columnatus), **Lycoperdon** cepaeforme (form nigrum), **Lycoperdon** gemmatum (?), **Lycoperdon** velutinum (Rev. Rick writes me that Lycoperdon velutinum is not the same as Lycoperdon fuligineum as I have published. I can find no difference in herbarium specimens, excepting color, but he is in better position to judge than I. He also sends under the name **Lycoperdon** tropicale, "Speg." what is surely Lycoperdon confluens, and these two species are probably the same and for me the same as the previous plant excepting habitat (on manure.), **Lycoperdon** (cfr. cruciatum too old), **Michenera** Rompelii (A curious tropical genus, unlike any of the temperate world. It has the general appearance of being a Peziza, but the spores which are very similar to those of the Nidulariaceae are not in asci, neither are they in peridioles.), **Nidularia** pisiformis, **Phallus** rugulosus (as labeled), **Tylostoma** Rickii.

STUCKERT, THEODORE, Argentina:

Cyathus stercoreus, **Geaster** mammosus, **Lenzites** striatus, **Lycoperdon** cruciatum, **Myriostoma** coliformis.

THIBOU, A., Antigua:

Cyathus stercoreus, **Lycoperdon** (sp. not recognized by me).

TURNER, E. J., Australia:

Geaster saccatus, **Lycoperdon** pratense.

VAN BAMBEKE, PROF. CHARLES, Belgium:

Bovista nigrescens, **Bovista** plumbea, **Fomes** salicinus, **Lycoperdon** pratense, **Polystictus** perennis, **Polystictus** versicolor, **Trametes** Trogii. Prof. Van Bambeke writes me that according to his observation Trametes Trogii and Trametes hispida are conditions of the same plant, a question that in the past has been the subject of considerable diversity of opinion and discussion between the French and English mycologists.

WATTS, W. W., New South Wales:

Bovistella bovistoides, **Calvatia** candida, **Calvatia** lilacina, **Calvatia** olivacea (? young), **Lycoperdon** cepaeforme.

WILSON, REV. JAMES, Australia:

Clathrus cibarius (Common in New Zealand, but the second specimen I have seen from Australia), **Cyathus** vernicosus, **Lycoperdon** nigrum, **Lycoperdon** pratense, **Polysaccum** crassipes, **Scleroderma** flavidum (Rev. Wilson states "very common here" and it seems to be the only *common* species of Scleroderma in Australia). Also several **Porias, Thelephoras,** etc., families I have never studied.

WOULFF, E., Crimea, Russia:

Calvatia candida (very rare in Europe), **Calvatia** lilacina, **Daedalea** quercina, **Daedalea** unicolor, **Fomes** fulvus, **Fomes** ignarius, **Lycoperdon** atropurpureum, **Polyporus** sulphureus, **Polystictus** versicolor, **Schizophyllum** commune, **Secotium** acuminatum, **Sistotrema** confluens, **Stereum** hirsutum, **Trametes** gibbosa (? Does not seem to be the same plant I so find in France).

ZIETZ, A., South Australia:

Battarea phalloides (rare), **Bovistella** scabrum, **Cyathus** vernicosus, **Geaster** minimus, **Geaster** saccatus (with a dark endoperidium), **Geaster** Smithii (The third collection known to me. Unfortunately in recording it, Myc. Notes, p. 292, Mr. Zietz's name was spelled Tietz.), **Lycoperdon** cepaeforme, **Mycenastrum** Corium, **Polystictus** obtectans (Compared with the types, and I am not so sure it is the same as Polystictus Montagnei of Europe as has been stated), **Scleroderma** flavidum (Two doubtful forms).

Specimens can be sent to my address below, and all will be acknowledged and placed in our museum for the benefit of future students.

C. G. LLOYD,
107 Boulevard St. Michel,
Paris, France.

LETTER No. 14.

Cincinnati, Ohio, June, 1907.

List of specimens from the United States and Canada received since the last report (June, 1906). We list here only the specimens that we recognize. Excepting as to the Gastromycetes we do not claim a critical knowledge of the subject, but only a general knowledge of the names current in American literature.

Our thanks are extended to those who have sent specimens, and we continue to solicit specimens of fungi suitable for "museum specimens." See circular enclosed.

C. G. LLOYD,
Court and Plum Streets,
Cincinnati, Ohio.

AMES, FRANK H., New York:

Crucibulum vulgare, **Daedalea** confragosa, **Daedalea** quercina, **Daedalea** unicolor **Favolus** europaeus, **Fomes** conchatus, **Lenzites** betulina, **Peziza** floccosa, **Polyporus** betulinus, **Polyporus** elegans, **Polyporus** gilvus, **Polyporus** (close to gilvus) and three species unknown to me, **Polystictus** cinnabarinus, **Polystictus** hirsutus, **Polystictus** pergamenus, **Polystictus** versicolor, **Schizophyllum** commune, **Stereum** (two species), **Xylaria** polymorphum.

BEARDSLEE, H. C., Illinois:

Trametes obtusus.

BESSEY, CHARLES E., Nebraska:

Lycoperdon pulcherrimum.

BITLER, JOHN, Kentucky:

Cordyceps militaris.

BLODGETT, F. H., Maryland:

Scleroderma Geaster.

BRAENDLE, FRED. J., Washington, D. C.:

Scleroderma (form), **Lenzites** saepiaria, **Geaster** hygrometricus, **Mycenastrum** Corium. (The latter is a very infrequent plant east of the Mississippi, though common west. This is about the fourth or fifth station known east of the Mississippi.)

BRENCKLE, DR. J. F., North Dakota:

Bovista plumbea, **Calvatia** caelata, **Catastoma** circumscissum **Cyathus** stercoreus, **Geaster** floriformis, **Lycoperdon** cepaeforme, **Lycoperdon** Wrightii, **Polystictus** versicolor, **Tylostoma** mammosum.

BREWER, C. R., Ohio:

Bovista pila, **Calvatia** craniiformis, **Calvatia** lilacina, **Cordyceps** ophioglossoides, **Crucibulum** vulgare, **Favolous** europaeus, **Fomes** leucophaeus, **Geaster** Archeri, **Geaster** rufescens, **Geaster** saccatus, **Geaster** triplex, **Helvella** (two species), **Lycoperdon** cruciatum, **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Lycoperdon** umbrinum (?), **Peziza** (two species), **Polyporus**

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BREWER, C. R.—Continued.
arcularius, **Polyporus** (sp.), **Polystictus** cinnabarinus, **Polystictus** hirsutus, **Scleroderma** aurantium **Schizophyllum** commune, **Secotium** acuminatum, **Thelephora** (three species), **Urnula Craterium.**

BREWER, W. A., California:

Calvatia occidentalis.

BROWN, CHARLES E., Wisconsin:

Peziza (Sarcoscypha) floccosa, **Peziza** (unknown to me), **Polyporus** (abortive), **Polyporus** rufescens, Pers., **Polyporus** elegans, **Polystictus** perennis, **Lentinus** vulpinus, **Fomes** fomentarius, **Polyporus gilvus, Lycoperdon** atropurpureum, **Stereum** spadiceum, **Geaster** triplex, **Polyporus** (on birch).

BUBNA, M., Ohio:

Bovista pila, **Daedalea** confragosa, **Daedalea** confragosa (lenzitoid form), **Fomes** applanatus (young), **Fomes** leucophaeus, **Lenzites** betulina, **Lenzites** betulina (form with yellow zones), **Merulius** incarnatus, **Morchella** conica, **Polyporus** (cfr. adustus), **Polyporus** Berkeleyi, **Polyporus** (cfr. cuticularis), **Polyporus** delectans, **Polyporus** flavo-virens (young), **Polyporus** gilvus, **Polyporus** picipes, **Polyporus** radicatus, **Polyporus** resinosus, **Polyporus** resinosus form Benzoinus, **Polyporus** sulphureus, **Polyporus** (unknown to me), **Polystictus** cinnamomeus, **Polystictus** hirsutus, **Polystictus** pergamenus, **Polystictus** versicolor, **Schizophyllum** commune, **Stereum** purpureum, **Stereum** spadiceum, **Stereum** versicolor.

BURGIN, MISS CAROLINE A., Pennsylvania:

Daedalea confragosa, **Hydnum** ochraceum (?), **Hydnum** spongiosipes, **Irpex** pachydon (?), **Lenzites** sepiaria, **Mitremyces** cinnabarinus, **Polyporus** adustus, **Polyporus** elegans, **Polystictus** cinnabarinus, **Polystictus** hirsutus, **Polystictus** perennis, **Polystictus** versicolor, **Poria** (young), **Stereum** rubiginosa, **Thelephora** intybacea, **Thelephora** Schweinitzii, **Trametes** funalis (surely exotic).

BURNHAM, STEWART H., New York:

Calvatia gigantea, **Hydnum** caput-ursi, **Lycoperdon** gemmatum, **Lycoperdon** gemmatum (large woods form), **Lycoperdon** piriforme, **Lycoperdon** umbrinum.

BURRILL, T. J., Illinois:

Calvatia rubro-flava.

DAVIS, SIMON, Massachusetts:

Bovista pila, **Daedalea** confragosa, **Daedalea** confragosa (lenzitoid form), **Lycogala** epidendrum, **Merulius** tremellosus, **Panus** rudis, **Polyporus** elegans, **Polyporus** lucidus, **Polystictus** cinnabarinus, **Polystictus** (cfr. cinnamomeus), **Polystictus** perennis (bleached), **Polystictus** versicolor, **Xylaria** polymorphum.

DEARNESS, JOHN, Canada:

Boletinus palustre, **Boletus** Clintonianus.

DEMETRIO, C. H., Missouri:

Daedalea confragosa, **Polyporus** (cfr. delectans), **Polyporus** distortus, **Trametes** obtusus.

DOBBIN, FRANK R., New York:

Fomes carneus, **Polyporus** betulinus.

DUBOIS, P. A., California:

Bovista plumbea. (This can be said to be a relic of the San Francisco earthquake. It was collected in one of the refugee camps shortly after the earthquake, where there were fully fifty or sixty people—whites, negroes, Chinese and other races—crowded in the neighborhood).

EDWARDS, STAFFORD C., New York:

Bovista pila, **Daedalea** confragosa (lenzitoid and polyporoid), **Fomes** connatus, **Fomes** fomentarius, **Fomes** ignarius, **Fomes** leucophaeus, **Hymenochaete** Curtisii, **Hymenochaete** rubiginosa, **Irpex** cinnamomeus, **Irpex** cinnamomeus (abnormal), **Lenzites** betulina, **Lycoperdon** piriforme, **Lenzites** sepiaria (polyporoid form),**Lenzites** sepiaria, **Lycoperdon** (sp. ?), **Lycoperdon** gemmatum, **Polyporus** adustus, **Polyporus** brumalis, **Polyporus** Curtisii, **Polyporus** gilvus, **Polyporus** lucidus, **Polyporus** (two species unknown to me), **Polysaccum** pisocarpium, **Polystictus** cinnamomeus, **Polystictus** conchifer, **Polystictus** hirsutus, **Polystictus** versicolor, **Poria** (on maple), **Stereum** acerinum, **Scleroderma** aurantium, **Scleroderma** cepa, **Scleroderma** flavidum, **Stereum** complicatum, **Stereum** versicolor, **Thelephora** (sp.).

EHRHORN, EDWARD, California:

Lycoperdon pratense.

ELL, HERBERT, Ohio:

Cyathus stercoreus.

ELY, EDWARD P., Minnesota:

Daedalea unicolor, **Lycoperdon** gemmatum, **Polystictus** versicolor, **Polystictus** pergamenus, **Cyathus** vernicosus, **Scleroderma** cepa **Secotium** acuminatum, **Polyporus** (unknown to me), **Tremella** (unknown to me).

FISHER, G. C., Ohio:

Polystictus cinnabarinus, **Daedalea** confragosa, **Polyporus** fumosus, **Lenzites** betulina, **Lycoperdon** piriforme, **Secotium** acuminatum, **Fomes** conchatus, **Irpex** tulipifera, **Polystictus** versicolor, **Marasmius** siccus, **Stereum** versicolor.

FITZGERALD, MISS MARY, North Carolina:

Hypomyces lactifluorum, **Panus** stipticus, **Irpex** cinnamomeus, **Lenzites** sepiaria, **Fomes** annosus, **Polystictus** versicolor, **Daedalea** confragosa, **Trametes** sepiaria, **Favolus** europaeus, **Thelephora** pteruloides, **Daldinea** concentrica, **Xylaria** (sp.), **Polystictus** cinnabarinus, **Peziza** aeruginosa, **Thelephora** pedicellata, **Hydnum** ochraceum, **Polyporus** resinosus, **Panus** rudis, **Hydnum** imbricatum, **Stereum** complicatum, **Lenzites** betulina, **Polystictus** pergamenus, **Corticium** salicinum, **Polyporus** flavo-virens, **Corticium** (sp. unknown to me), **Polystictus** (close to hirsutus), **Fomes** (young, probably leucophaeus), **Clitopilus** abortivus, **Lentinus** ursinus (or vulpinus, I do not know the difference), **Thelephora**, **Spumaria** alba, **Geoglossum** (sp.), **Schizophyllum** commune, **Thelephora** (a most peculiar species that I never saw before), **Thelephora** Schweinitzii, **Stereum** spadiceum, **Polystictus** abietinus, **Poria** spissa, Schw. (?), **Daedalea** unicolor (typical), **Daedalea** unicolor (sterile), **Thelephora** vialis, **Cordyceps** militaris.

GREATA, L. A., California:

Phallus imperialis, **Gyrophragmium** Texense, **Lycoperdon** (cfr. cruciatum).

GRIFFITH, D., Arizona:

Helvella infula (?), **Clavaria.**

HAMNER, C. C., Connecticut:

Polyporus flabelliformis, **Polyporus** rutilans, **Fomes** Everhartii, **Polyporus** Spraguei, **Polyporus** sessile, **Polyporus** galactinus, **Polyporus** perplexus, **Lycoperdon** Turneri, **Tylostoma** campestre (an extremely eastern station for this species), **Lycoperdon** muscorum, **Stereum** fasciatum.

HAPEMAN, H., Montana:

Calvatia occidentalis, **Geaster** asper, **Lycoperdon** Wrightii.

HARD, M. E., Ohio:

Polyporus volvatus.

HENDERSON, W. H., California:

Bovista plumbea (a robust, western form), **Bovista** pila (rare in California), **Phallus** imperialis.

HIGHAM, MISS ADDIE, Michigan:

Polyporus picipes, **Hypomyces** Lactifluorum, **Morchella** conica, **Hydnum** adustum, **Clitocybe** illudens, **Collybia** radicata, **Geaster** minimus, **Hydnum** coralloides, **Mycena** Leaiana, **Pluteus** cervinus.

HILL, A. J., Canada:

Polyporus volvatus.

HOLDEN, CAPTAIN WM., Ohio:

Polyporus (on pine), **Polyporus** sessile (a wintered specimen), **Polystictus** cinnabarinus, **Polystictus** hirsutus (wintered specimens), **Polyporus** arcularius.

HOWELL, GEO. T., Indiana:

Polyporus Berkeleyi (thin form).

HRDLICHA, A., Washington, D. C.:

Favolus europaeus (old, bleached specimens), **Geaster** rufescens.

HUNTINGTON, J. W., Massachusetts:

Polyporus frondosus, **Polyporus** betulinus (stalked), **Trametes** suaveolens, **Polyporus** (unknown to me), **Polystictus** pergamenus, **Fomes** conchatus, **Polystictus** versicolor, **Polystictus** (unknown to me), **Polyporus** brumalis, **Polyporus** (cfr. rufescens), **Daedalea** confragosa, **Trogia** crispa, **Geaster** coronatus.

JOHNSTON, EARL L., Colorado:

Lycoperdon umbrinum, **Bovista** plumbea, **Lycogala** epidendrum, **Mycenastrum** Corium, **Calvatia** caelata, **Catastoma** subterraneum, **Secotium** acuminatum, **Cyathus** stercoreus.

JONES, MISS KATE A., New Hampshire:

Polystictus versicolor, **Panus** stipticus, **Lenzites** betulina, **Polystictus** hirsutus, **Fomes** carneus, **Daedalea** confragosa, **Daedalea** unicolor, **Schizophyllum** commune, **Lycoperdon** piriforme, **Polystictus** pergamenus, **Polyporus** perennis, **Polystictus** cinnabarinus, **Bovista** pila.

KAUFFMAN, C. M., Michigan:

Polyporus fraxineus. (A very rare plant in the United States. Mr. Kauffman's specimen accords exactly with the European specimens). **Fomes** carneus, **Fomes** pinicola, **Fomes** conchatus, **Polystictus** abietinus, **Fomes** connatus, **Daedalea** unicolor, **Fomes** ignarius (resupinate and sub-resupinate), **Polyporus** amorphus, **Polyporus** griseus?, **Fomes** (cfr. ignarius), **Polyporus** gilvus, **Polyporus** (white Apus), **Polystictus** biformis (irpex form), **Fomes** ignarius (very?), **Polystictus** (close to velutinus), **Polyporus** (cfr. cuticularis), **Polyporus** (cfr. stipticus), **Polyporus** (cfr. pubescens), **Poria** (3 species), **Hymenochaete** tabacina.

KENNEDY, P. B., Nevada:

Tylostoma rufum, **Podaxon** Farlowi, **Catastoma** (undescribed).

KNAEBEL, ERNEST, Colorado:

Catastoma nigrescens (not described), **Mycenastrum** Corium (growing with Catastoma nigrescens), **Tylostoma** Americanum, **Tylostoma** campestre.

LAKE, E. R., Oregon:

Lycoperdon pratense, **Poria** obliquus (?).

LANE, MISS ROSE H., California:

Fuligo septica, **Lycoperdon** pratense. (I am convinced now that we can not keep our American plant distinct from the European, and it is curious that it occurs with us only on our extreme western and eastern coasts). **Bovista** plumbea (?, unusually large), **Catastoma** (unnamed), **Geaster** giganteum, **Polyporus** grammocephalus (as named for me from Samoa),**Poria**, **Polystictus** xanthopus, **Polystictus**. (Miss Lane's polyporoids are of a tropical type, some unrecorded from the United States).

LANGTON, THOMAS, Canada:

Lycogala epidendrum, **Myxomycetes** (three species), **Tremelloid**, **Peziza**, **Tremellodendron** gelatinosum, **Gyrocephalus** rufus, **Polyporus** (two species), **Polystictus** cinnabarinus, **Fomes** leucophaeus, **Lycoperdon** piriforme, **Xylaria**, **Thelephora** Schweinitzii, **Lycogala** epidendrum, **Hydnum**, **Spathularia** flavida.

LEHMAN, E. A., North Carolina:

Morchella, **Scleroderma** aurantium, **Trametes** trabea, **Mitremyces** cinnabarinus, **Polyporus** elegans, **Polyporus** Curtisii.

LLOYD, JOHN URI, Ohio:

Geaster Archeri.

MORRIS, GEO. E., Massachusetts:

Geoglossum, **Geoglossum** flavum, **Peziza** (3 species), **Helvella** macropus, **Helvella**, **Leotia**, **Geoglossum** hirsutum, **Polyporus** brumalis, **Daedalea** confragosa (marked form), **Polystictus** cinnamomeus, **Thelephora** diaphanum, **Polystictus** tomentosa (?), **Polystictus** obesus (?), **Polyporus**, **Tylostoma** campestre (slender form), **Polyporus** volvatus.

NOBLE, MRS. M. A., Florida:

Catastoma pedicellatum, **Boletus**, **Scleroderma** cepa, **Trametes** hydnoides, **Hypomyces** Lactifluorum, **Polystictus** versicolor, **Lenzites** betulina, **Lycoperdon** gemmatum, **Polystictus** versicolor, **Polyporus** betulina, **Catastoma** circumscissum, **Myriostoma** coliforme.

NELSON, N. L. T., Missouri:

Polystictus versicolor, **Peziza** scutellata, **Stereum** frustulosum, **Myxomycetes**, **Lycogala** epidendrum, **Lycoperdon** piriforme.

PARISH, S. B., California:

Calvatia pachyderma, **Mycenastrum** Corium.

PECK, PROFESSOR CHAS. H., New York:

Scleroderma tenerum.

PLITT, CHARLES C., Maryland:

Lycoperdon piriforme, **Polyporus** dichrous, **Daedalea** confragosa, **Fomes** leucophaeus, **Trametes** suaveolens, **Daedalea** quercina, **Polyporus** sulphureus (old), **Geaster** hygrometricus, **Lycoperdon** gemmatum, **Scleroderma** (immature), **Polyporus** brumalis, **Mitremyces** cinnabarinus, **Scleroderma** aurantium, **Urnula** Craterium, **Stereum** frustulosum, **Trametes** cinnabarinum, **Polystictus** versicolor, **Hypoxylon**, **Scleroderma** (young), **Clavaria** pistillaris, **Daldinea concentrica**.

RATHBUN, FRANK R., New York:

Xylaria polymorphum.

REDDICK, DONALD, New York:

Corticium salicinum, **Peniophora** allecheri, **Fomes** (on elm), **Merulius** tremellosus, **Polyporus** dichrous, **Lenzites** sepiaria, **Phlebia** merismoides, **Hypomyces** lactifluorum, **Stereum** radiatum. (All as named by Mr. Reddick).

RIDDLE, LINCOLN W., Massachusetts:

Polyporus (cfr. picipes), **Polystictus** hirsutus, **Daedalea** confragosa, **Fomes** fomentarius, **Daedalea** unicolor, **Fomes** carneus, **Lenzites** sepiaria, **Polystictus** perennis, **Corticium** (two species), **Stereum** purpureum, **Hymenochaete**, **Solenia**, **Stereum**.

RUGG, ELLEN M., Washington, D. C.:

Polyporus betulinus.

SANFORD, J. A., California:

Nectria cinnabarinus.

SCHUMO, S. L., Pennsylvania. (Specimens from Newfoundland):

Bovista pila, **Hirneola** auricula-Judae, **Panus**, **Polyporus**, **Polystictus** aurantius (very rare), **Lenzites sepiaria**.

SEWALL, MISS M. L., Washington, D. C.:

Polystictus versicolor, **Polystictus** hirsutus, **Polyporus** gilvus (with orange mycelium strands), **Polystictus** versicolor, **Poria** (cfr. vaporinus), **Stereum** sericeum, **Trametes** abietis, (**Polyporus** piceinus, Pk.), **Hymenochaete** rubiginosa, **Polyporus** adustus, **Polystictus** pergamenus, **Hymenochaete** Curtisii, **Irpex** (not sure).

SHEPHERD, DR. I. M., New Jersey:

Polyporus Berkeleyi, **Polyporus** Curtisii, **Polyporus** (cfr. distortus), **Polyporus** distortus, **Polystictus** cinnabarinus, **Polystictus** versicolor, **Polystictus** brumale, **Irpex** cinnamomeus, **Polyporus**, **Peziza** vesiculosa.

SMITH, G. D., Ohio:

Fomes pinicola (on birch), **Fomes** ignarius, **Lentinus** lepideus, **Daedalea** confragosa, **Stereum** versicolor (?), **Polystictus** cinnabarinus, **Polyporus** brumalis, **Sclerotinia** tuberosa, **Discina** venosa (Det. Durand), **Gyromitra** brunnea.

SMITH, THEODATE L., Massachusetts:

Stereum rubiginosum, **Poria**, **Polyporus** radiatus, **Stereum** hirsutum, **Polyporus**, **Poria** tulipifera, **Daedalea** unicolor, **Lenzites** sepiaria (polyporoid form), **Polystictus** (sp.), **Polystictus** hirsutus, **Polyporus** adustus, **Polystictus** cinnabarinus, **Polyporus** tsugae, **Daedalea** confragosa, **Stereum**, **Hydnum** vellereum (very fragrant when received), **Polystictus** obesus, E. & E. (?), **Fomes** conchatus, **Polyporus** (unknown to me), **Daedalea** unicolor, **Polyporus** elegans, **Daedalea** confragosa.

SPAULDING, PERLEY, Missouri:

Favolus europaeus, **Polyporus** arcularius.

STERLING, E. B., New Jersey:

Thelephora, **Daedalea** ambigua (young), **Polyporus** (with parasitic species), **Lenzites** betulina, **Daedalea** quercina, **Stereum** versicolor, **Polyporus** gilvus, **Polyporus** (four species), **Polystictus** pergamenus, **Corticium**, **Daedelea** quercina, **Poria**, **Panus** stipticus (old?), **Polyporus** brumalis, **Irpex** lactea, **Daedalea confragosa**, **Polyporus** gilvus, **Phallus** Ravenelii (mycelium bearing *hundreds* of young eggs), **Irpex** tulipifera, **Polystictus** hirsutus, **Daedalea** confagosa, **Fomes** leucophaeus, **Stereum** complicatum, **Leizites** corrugata (very **peculiar** form), **Panus** stipticus, **Polystictus** (cfr. versicolor), **Hydnum**, **Polystictus** versicolor, **Lenzites** corrugata, **Lenzites** sepiaria, **Polyporus** rufescens, **Peziza** vesiculosa, **Polystictus** cinnabarinus, **Schizophyllum** commune, **Irpex** cinnamomeus.

STEVENS, F. L., North Carolina:

Cyathus Lesueurii, **Mitremyces** Ravenelii, **Calvatia** craniiformis, **Mitremyces** lilacina, **Scleroderma** flavida, **Irpex** cinnamomeus.

STEVENSON, WM. C., Pennsylvania:

Geoglossum (capitate, close to hirsutum).

STOCKBERGER, W. W., Canada:

Lycoperdon gemmatum.

SUTLIFF, MISS MARY L., California:

Polyporus volvatus, **Tremella** mesenterica, **Tremella** lutescens.

THOMPSON, G. F., Ohio:

Polystictus cinnabarinus, **Thelephora** multipartita (rare), **Mycena** Leaiana, **Xylaria** polymorphum, **Daedalea** confragosa, **Polystictus** conchifer, **Polyporus** picipes (?), **Polyporus** dichrous, **Stereum** versicolor, **Daedalea** unicolor, **Panus** stipticus.

TRUE, DR. H. L., Ohio:
Xylaria polymorphum.

WALDRON, L. R., North Dakota:
Fomes fraxinophilus, **Poria**.

WALKER, MISS I. M., Canada:
Bulgaria rufa, **Pyrenomycetes** (?, genus unknown to me; black spores imbedded in the tissue).

WHETSTONE, DR. MARY S., Minnesota:
Leotia, **Polystictus** (pores very minute), **Helvella**, **Polystictus** pergamenus, **Favolus** europaeus, **Daedalea** confragosa, **Peziza**, **Craterellus** cornucopoides, **Schizophyllum** commune, **Cantharellus** cinereus, **Lycoperdon** gemmatum, **Stereum**, **Polyporus** arcularius, **Polystictus** perennis, **Lenzites** betulina, **Polystictus** versicolor, **Thelephora**, **Polyporus** brumale, **Lentinus** cochleatus, **Geoglossum**, **Thelephora** Schweinitzii, **Panus** rudis, **Polystictus** obesus (?), **Reticularia** Lycoperdon, **Polystictus** versicolor (?), **Geoglossum**, **Geaster** triplex, **Panus** stipticus, **Scleroderma**, **Polyporus** gilvus, **Hydnum** adustum, Schw., **Pterula** multifida, Fr., (Thelephora filamentosa, B. & C.), **Polyporus** dichrous, **Lycoperdon** polytrichum, **Polystictus** cinnamomeus.

WILDER, MRS. CHARLOTTE M., California:
Geaster fornicatus (this is the third time the plant has ever been found in the United States), **Bovistella** dealbata (the spores distinctly rough), **Scleroderma** cepa.

REMARKS.

The copy for this letter was put in the printer's hands in June, but it was slow in getting through, and it was not issued until August. In the meantime a large number of additional specimens have been received, which will be acknowledged in the next letter.

I often get letters from correspondents who state they do not know the species, and do not send specimen because they fear they may send only common species. I trust no one will hesitate on this account. While the greater part of the specimens I receive are common plants, any one who picks up the fungi he finds is likely to gather something rare. As a matter of fact, I seldom get a package of specimens that I do not find in it something that I am glad to get.

We have an abundance of room to preserve all the specimens that may be sent, both common and rare. A new building is under construction that will be devoted entirely to books, and three floors of the old building, each twenty by eighty feet, will be used solely as a museum of fungi. There is ample room in this building to preserve a half-million specimens, so I hope no one will be backward about sending specimens for fear they will not be acceptable. Every specimen will be preserved, whether it be common or rare, and will be labeled with the collector's name and locality.

C. G. LLOYD,
Court and Plum Streets,
Cincinnati, Ohio.

LETTER No. 15.

Cincinnati, Ohio, May, 1907.

List of specimens received from Europe and foreign countries since the last report (September, 1906). My thanks are extended to all who have kindly sent specimens. It will be noted that many of the plants acknowledged in this letter belong to the Polyporaceae. I am just beginning a study of these plants, and at present do not claim any critical knowledge of the subject. Many of the specimens I have received named, and in such cases they are listed here under the names as received. I am now soliciting specimens only of the Polyporaceae (viz: Polyporus, Fomes, Trametes, Daedalea, etc.) from my European correspondents. So many specimens of Gastromycetes have been received that I do not ask others excepting from those who reside in extreme southern Europe. However, I will very gladly name specimens of the Gastromycetes for those who so desire.

Se voi avete residenza in Italia, nel Sud della Francia, in Spagna o Portogallo, voi non potreste farmi favore piu grande, che di mandar mi i vostri Gastromiceti. De tutte le sezioni d'Europa di cui io non ho conoscenza dei Gastromiceti e l'estrema porzione meridonale. Vi sono species di questi funghi nelle parti del Sud che sono assai poco conoscinte.

My publications are sent to those who favor me with specimens, and I hope they are a partial return for the trouble.

Yours very truly,

C. G. LLOYD,
(Klincksieck) No. 3 rue Corneille (Odéon),
Paris VI, France.

ARNOULD, LEON, France:

Daedalea quercina, **Favolus** europaeus, **Fomes** applanatus, **Fomes** fraxineus, **Lenzites** betulina, **Lenzites** sepiaria, **Polyporus** frondosus, **Polyporus** numularius, **Polyporus** squamosus, **Polyporus** sulphureus, **Polyporus** varius, **Polystictus** versicolor, **Trametes** gibbosa, **Trametes** suaveolens.

BADET, REV. L., Italy:

Calvatia saccata, **Lenzites** betulina, **Lycoperdon** umbrinum, **Polyporus** adustus, **Polyporus** biennis, **Polyporus** versicolor, **Polystictus** (sp.), **Schizophyllum** commune.

BARBIER, M., France:

Fomes fulvus, **Lenzites** flaccida, **Lenzites** sepiaria (or Trametes abietina), **Polyporus** adustus, **Polyporus** dryadeus, **Polyporus** fumosus, **Polyporus** fumosus (?), **Polyporus** picipes, **Polyporus** rutilans, **Polystictus** hirsutus, **Polystictus** versicolor, **Poria** obduceus (?), **Trametes** (sp.), **Trametes** hispida (form flavida), **Trametes** hispida, **Trametes** gibbosa.

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

BATEMAN, T. H., England:

Specimen determined as "**Fomes** vaporarius, Fr." No such species. It is an anomaly of some kind.

BERNIN, A., Monaco:

Clathrus cancellatus (eggs), **Polystictus** hirsutus.

BEZZI, M., Italy:

Bovista nigrescens, **Lycoperdon** cepaeforme, **Scleroderma** verrucosum.

BIERS, MONSIEUR, France:

Polystictus versicolor (?).

BIGEARD, RENE, France:

Bovista plumbea, **Calvatia** caelata (smooth form), **Lycoperdon** gemmatum, **Lycoperdon** piriforme, **Lycoperdon** pratense, **Lycoperdon** spadiceum, **Lycoperdon** umbrinum, **Lycoperdon** umbrinum (?).

BOGARD, CAPITAINE, France:

Fomes applanatus, **Fomes** fraxineus, **Fomes** rubriporus (vide Boud.), **Stereum** hirsutum.

BOTANICAL GARDEN, India:

Daedalea elegans, **Lenzites** (cfr. betulina), **Polyporus** (two species), **Polystictus** sanguineus.

BOTANICAL GARDEN, Zurich, Switzerland:

Bovista nigrescens.

BOUDIER, E., France:

Trametes confragosa (?).

BRACE, L. J. K., Bahamas:

Auricula auricula-Judae, **Cantharellus** (sp.), **Hydnum** (sp.), **Hymenogaster** (?), **Panus** Wrightii.

BRANDIS, PROFESSOR ERIC, Bosnia:

Lycoperdon piriforme. (A very peculiar form close to tessellatum. In its general effect it resembles a Scleroderma for which I at first took it. It is surely entitled to a varietal name, and I shall call it sclerodermoides.), **Scleroderma** verrucosum (?).

BREITUNG, REV. A., Denmark:

Bovista nigrescens, **Geaster** triplex, **Lycoperdon** umbrinum, **Polyporus** caesius, **Polyporus** elegans, **Polyporus** radiatus, **Polyporus** "radioperda, Hart" (for me a form of annosus), **Polyporus** roburneus!! (compared with the type at Kew), **Polyporus** varius (?) old, **Polystictus** perennis, **Polystictus** versicolor, **Scleroderma** verrucosum, **Trametes** gibbosa.

BROWN, JAMES G., Philippines:

Calvatia occidentalis, **Calvatia** occidentalis (sterile base), **Catastoma** annomalum (spores one to two mic. smaller than the Australian form), **Discomycetes** (?), **Lycoperdon** (probably new), **Lycoperdon** (close to preceding), **Stereum** (sp).

BUTLER, E. J., India:

Bovista (cfr. bicolor), **Calvatia** Gardneri (?), **Cyathus** limbatus, **Cyathus** microsporus, **Lycoperdon** (? young), **Lycoperdon, Bovistella** (section Bovista), **Lycoperdon** (cfr. microsporum), **Lycoperdon** (cfr. pratense), **Lycoperdon** (cfr. Wrightii), **Podaxon** pistillaris, **Scleroderma** caespitosum (new form of verrucosum), **Sclerodema** dictyosporum.

COBB, N. A., Hawaii:

Phallus aurantiacus.

COTTON, A. L., England:

Lycoperdon gemmatum (form), **Lycoperdon** spadiceum.

CROSSLAND, CHARLES, England:

Calvatia caelata, **Calvatia** saccata, **Lycoperdon** excipuliforme (?), **Lycoperdon** gemmatum, **Lycoperdon** nigrescens, **Lycoperdon** piriforme, **Lycoperdon** pratense (?, same externally, but smooth and of a different shape), **Lycoperdon** pratense, **Lycoperdon** spadiceum, **Scleroderma** aurantiacum, **Scleroderma** verrucosum, **Sphaerobolus** stellatus.

CRUCHET, DENIS, Switzerland:

Bovista nigrescens.

DONOR, UNKNOWN, France:

Polyporus hispidus.

DONOR UNKNOWN, New Zealand:

Bovista brunnea, **Calvatia** caelata, ripe, **Calvatia** caelata (typically the areolate form with the largest areoles I ever saw), **Scleroderma** (sp).

ENGELKE, C., Germany:

Fomes ribis, **Polystictus** versicolor, **Polyporus** adustus, **Daedalea** quercina, **Polyporus** brumalis, **Polyporus** radiatus, **Polyporus** adustus, **Polyporus** annosus, **Polyporus** varius, **Polystictus** abietinus, **Fomes** fulvus, **Fomes** applanatus, **Polyporus** radiatus, **Fomes** Euonymi, **Trametes** gibbosa, **Fomes** nigrescens, **Polyporus** betulinus, **Poria** radula, **Daedalea** Poetschii, **Poria** obliquus, **Poria** medulla-panis, **Poria** ferruginosus, **Poria** nitidus, **Polyporus** albidus.

FROGGATT, WALTER W., Australia:

Bovista brunnea (cortex close to cepaeforme), **Catastoma** annomalum (?), **Geaster** floriformis.

GAMMIE, G. A., India:

Polyporus lucidus, **Stereum** (cfr. obliquus).

GARDNER, FRED, England:

Calvatia caelata, **Lycoperdon** pratense.

GIBBS, THOMAS, England:

Bovista nigrescens, "**Lycoperdon** excipuliforme" (as known in England, I think), **Lycoperdon** piriforme, **Lycoperdon** velatum.

GILL, WALTER, Australia:

Battarrea phalloidea, **Calvatia** lilacina, **Lycoperdon** cepaeforme, **Polystictus** cinnamomeus, **Scleroderma** flavidum, **Bovista** brunnea, **Thelephora** (sp).

GONO, M., Japan:

Lycoperdon (cfr, umbrinum), **Geaster** hygrometricus, **Polysaccum** piscocarpium (globose form-tuberosum), **Geaster** (cfr. saccatus), **Lycoperdon** gemmatum, **Cyathus** stercoreus.

GUILFOYLE, W. R., Australia:

Hymenogaster (n. s.), **Melanogaster** variegatus (?) **Scleroderma** (n. s. ?), (cfr. cepa).

HARIOT, P., Africa:

Polyporus xanthopus.

HARIOT, P., China:

Mitremyces oriruber.

HARIOT, P., France:

Fomes fraxineus, teste Bres., **Lenzites** flaccida, **Polyporus** numularius, **Polyporus** picipes, **Polyporus** tephroleucus (Det. Patouillard).

HARIOT P., Madagascar:

Cyathus limbatus.

HARRIS, WILLIAM, Jamaica:

Bovista bicolor.

HOLMES, E. M., England:

Daedalea confragosa.

HY, PROFESSOR F., France:

Tylostoma mammosus.

JAAP, OTTO, Germany:

Polyporus fumosus, **Polyporus** caesius (Populus tremula), **Polystictus** abietinus (Pinus sylvestris),**Trametes** gibbosa (Fagus), **Polyporus** amorphus (Pinus sylvestris), **Polyporus** rufescens (Salix), **Polyporus** tephroleucus (on Picea excelsa), **Polyporus** lacteus (Populis), **Polyporus** albidus (on Picea excelsa), **Lycoperdon** Desmazieres.

JAMES, H. S., Australia:

Calvatia lilacina, **Geaster** floriformis (?, unopened), **Geaster** minimus, **Geaster** saccatus (tending towards triplex), **Mylitta** australia, **Scleroderma** flavidum.

KARASEK, A., Deutsch Ost. Africa.

Lenzites repanda, **Daldinea** concentrica?, **Corticium**, **Xylaria**.

KRUGER, PROFESSOR WM., Germany:

Polyporus adustus, **Polyporus** vernalis (?) (old), **Polystictus** perennis, **Rhizopogon** rufescens (?), **Scleroderma** cepa (?), **Bovista** nigrescens, **Fomes** ignarius, **Lycoperdon** piriforme, **Polyporus** (sp.), **Polyporus** adustus, **Polyporus** obduceus, **Trametes** suaveolens, **Calvatia** caelata, **Calvatia** saccata, **Lycoperdon** atropurpureum (?).

LABESSE, DOCTEUR, France:

Lycoperdon (cfr. Wrightii), collected in Congo Belge, Africa.

LAGARDE, PROFESSOR J., France:

Polyporus (sp.), **Polyporus** elegans, **Polystictus** hirsutus, **Polystictus** perennis.

LIND, JENS, Denmark:

Daedalea unicolor, **Fomes** fomentarius, **Fomes** pinicola, **Fomes** salicinus, **Polyporus** brumalis, **Polyporus** varius, **Polyporus** vulpinus, **Trametes** Bulliardi.

LUDWIG, MONSIEUR L., France:

Polyporus varius, **Polystictus** versicolor, **Polystictus** zonatus (teste Bres.), **Mycenastrum** Corium, **Fomes** connatus, **Polyporus** adustus, **Polyporus** adustus (different from what I know), **Polystictus** Montagnei, **Fomes** conchatus, **Polyporus** spumeus (teste Patouillard).

MASSALONGO, PROFESSOR C., Italy:

Fomes Ingazae, **Lycoperdon** pratense, **Polyporus** lucidus, **Polyporus** varius, **Polystictus** versicolor.

MERINO, F., Spain:

Bovista plumbea, **Lycoperdon** pusillum.

MILLE, REV. L., Ecuador:

Bovista nigrescens, **Catastoma** subterraneum, **Lycoperdon** Wrightii.

MILLEN, H., Tobago:

Hirneola auricula-Judae.

MIYABE, K., Japan:

Nidula microcarpa. (Probably the plant that has beeen taken in Japan as Crucibulan vulgare).

MOISSET, LEON, France:

Lycoperdon gemmatum, **Lycoperdon** pratense, **Lycoperdon** umbrinum.

MOREAU, DR., France:

Ganoderma applanatus, **Ganoderma** resinaceum, **Polyporus** adustus, **Polystictus** versicolor, **Queletia** mirabilis.

MUNDT, DR. C., Denmark:

Polyporus Schweinitzii.

NAVAS, REV. L., Spain:

Polyporus nidulans, **Polystictus** versicolor, **Scleroderma** cepa, **Trametes** hispida.

NISHIDA, TOJI, Japan:

Cyathus stercoreus, **Geaster** hygrometricus, **Lycoperdon** (cfr. Turneri), **Mitremyces** Ravenelii, **Scleroderma** (sp.), **Scleroderma** (cfr. verrucosum).

NOACK, FRITZ, Germany:

Polyporus betulinus, **Thelephora** terrestris, **Fomes** annosus, **Lenzites** sepiaria, **Fomes** applantus (very?), **Fomes** annosus, **Trametes** odorata, **Polyporus** (sp.), **Polyporus** dichrous (?), **Lenzites** sepiaria, **Polyporus** stipticus, **Polyporus** giganteus (?), **Trametes** gibbosa, **Polyporus** Schweinitzii (?), **Lycoperdon** spadiceum.

O'CONNOR, CHAS. A., Mauritius:

Anthracophlous rhizopognoides (new species as determined by Mattirolo and so named by him.)

PANAU, DR. CHARLES, France:

Daedalea biennis, **Daedalea** quercina, **Fomes** leucophaeus, **Fomes** nigricans, **Fomes** pinicola, **Fomes** ribis, **Fomes** pomaceus, **Polyporus** calceolus, **Polyporus** imberbis, **Trametes** Bulliardii, **Trametes** gibbosa, **Trametes** suaveolens, **Polyporus** adustus (?), **Lenzites** sepiaria, **Polyporus** adustus, **Geaster** coronatus, **Geaster** fimbriatus, **Polyporus** betulinus, **Polyporus** fumosus (Det, by Bresadola as imberbis, Bull.), **Trametes** mollis(?).

PATOUILLARD, N., France:

Septobasidium Cerestianum, **Tuber** excavatum.

PAZSCHKE, Dr. O., Germany:

Trametes Trogii, **Trametes** odorata, **Trametes** gibbosa, **Fomes** australis (?), **Fomes** ignarius, **Polyporus** betulinus, **Polyporus** giganteus, **Polyporus** dryadeus, **Polyporus** squamosus, **Polyporus** sulphureus, **Polyporus** brumalis, **Polyporus** umbellatus, **Polystictus** abietinus, **Polyporus** frondosus, **Polyporus** hirsutus, **Fomes** annosus, **Polystictus** perennis, **Polystictus** versicolor, **Polyporus** adustus, **Polyporus** fumosus, **Daedalea** unicolor, **Fomes** pinicola, **Fomes** ignarius, **Fomes** Euonymi, **Polystictus** zonatus, **Polyporus** Weinmanni, **Poria** corticola, **Poria** chrysoloma, **Polyporus** amorphus, **Polyporus** Braunnii, **Polyporus** zonatus (?), **Poria** Vaillantii.

PETCH, T., Ceylon:

Cyathus Poeppigii, **Cyathus** stercoreus, **Cyathus** triplex, **Cyathus** (undescribed), **Nidula**, n. s. ?, **Lycoperdon** gemmatum, **Lycoperdon** purpurascens, **Lycoperdon** n. s.

POTTER, M. C., England:

Fomes annosus, **Daldinea** concentrica, **Scleroderma** aurantium, **Daedalea** quercina,**Ustulina** vulgaris, **Helvella**, **Fomes** ignarius?, **Hirneola** auricula-Judae, **Fomes** (sp. ?), **Cyathus** vernicosus, **Daedalea** quercina, **Lycoperdon** gemmatum, **Scleroderma** Cepa, Pers., **Thelephora**.

REA, CARLETON, England:

Poria (two species).

ROLLAND, L., Corsica:

Polysaccum pisocarpium (or rather the form "crassipes." It is probable that "Polysaccum Cranium, Lev.," described from Corsica, is this same plant).

ROLLAND, L., France:

Daedalea biennis, **Daedalea** quercina, **Fistularia** hepatica, **Fomes** conchatus, **Geaster** mammosus, **Polyporus** betulinus, **Polyporus** lucidus, **Polyporus** rutilans, **Polystictus** perennis, **Trametes** Bulliardi, **Trametes** gibbosa, **Geaster** fimbriatus, **Calvatia** saccata, **Lycoperdon** gemmatum, **Lycoperdon** piriforme.

SHAW, MISS STELLA, Jamaica:

Geaster saccatus.

SMITH, MISS ANNIE LORRAIN, England:

Daedalea unicolor?, **Fomes** applanatus, **Lycoperdon** piriforme, **Polyporus** biennis (or as known in England, rufescens), **Polyporus** radiatus.

SWANTON, E. W., England:

Daedalea confragosa, **Daedalea** confragosa (lenzitoid form), **Daedalea** confragosa (polyporoid form), **Daedalea** quercina, **Polyporus** frondosus, **Polyporus** nidulans, **Polystictus** perennis, **Trametes** gibbosa, **Polyporus** nodulosus.

VAN BAMBEKE, PROFESSOR CH., Belgium:

Calvatia saccata, **Lycoperdon** gemmatum, **Polyporus** adustus, **Scleroderma** Bovista (*historic*), **Trametes** Trogii.

WEIDMANN, ANT., Austria:

Polyporus adustus, **Polyporus** versicolor, **Trametes** pini (?), **Trametes** suaveolens, **Polyporus** radiatus, **Fomes** applanatus, **Polyporus** (sp), **Lycoperdon** piriforme, **Daedalea** unicolor, **Fomes** applanatus, **Lenzites** betulina, **Lenzites** sepiaria, **Polyporus** radiatus, **Polyporus** tubarius (?), **Polystictus** hirsutus, **Polystictus** perennis, **Polystictus** versicolor, **Trametes** pini, **Calvatia** saccata, **Daedalea** quercina, **Lycoperdon** gemmatum, **Polyporus** frondosus, **Polyporus** giganteus, **Polyporus** radiatus, **Polyporus** sulphureus.

WESTERVELT, MRS. CAROLINE CASTLE, Hawaii:

Catastoma (I think unnamed, and the first collection of this genus made in Hawaii), **Lycoperdon** Wrightii, **Schizophyllum** commune.

WULFF, E., Austria:

Polystictus perennis, **Fomes** annosa (resupinate), **Lenzites** sepiaria (polyporoid), **Trametes** odorata (?), **Trametes** hispida, **Lenzites** sepiaria, **Geaster** pectinatus, **Lycoperdon** atropurpureum (?), **Trametes** odorata, **Daedalea** quercina.

WULFF, E., Russia:

Calvatia lilacina, **Lycoperdon** pratense.

REMARKS.

As our work thus far with the polyporoids has been largely introductory, the names used are to an extent tentative. For the European polyporoids we expect to adopt in the main the names used by Fries, for they are definite, well known, and well established. Fries did most excellent work with the polyporoids, as he did with all Hymenomycetes, and I can see no object in pulling down his structure for the purpose of substituting another that probably would not be half as good. When I do not adopt Fries' names, it will be in cases where I find that he has been mistaken as to facts, for Fries did not have the opportunities to get specimens that we have now. He drew his conclusions regarding the plants of Europe (with the exception of Sweden) largely from books, and no doubt he has included some errors. Personally, I do not approve of the work of the class of modern name-jugglers, who work over the so-called synonyms and shuffle the names around, putting it forth as original work, when, as a matter of fact, nine-tenths of it is pure piracy. One-half of these old synonyms are not true, and the other half are of no importance if they are.

I have never been able to learn the difference between Polyporus frondosus and Polyporus intybaceus. Several mycologists with whom I have talked claim to know a difference, but none of them have been able to explain it to me. I know only one plant, which I am satisfied should be called Polyporus frondosus. If you know them both, will you not favor me by sending specimens showing the difference?

I should appreciate any specimens of any polyporoids that you may send me. I ask only that they be *well dried* before wrapping, for they will be delayed before reaching me, and if sent moist will spoil before I get them.

Send to the following address, and they will reach me in time:

C. G. LLOYD (Klincksieck),
No. 3 rue Corneille (Odéon),
Paris VI, France.

LETTER No. 16.

Cincinnati, Ohio, November 1, 1907.

List of specimens received from the United States and Canada from the last report, June, 1907, up to the first day of September.

We list these specimens as they may be known to us, though we claim no critical knowledge of the subject other than concerning the Gastromycetes. We have, however, a general knowledge of the names of fungi that occur in American literature.

Our thanks are extended to those who have sent specimens, and we continue to solicit specimens suitable for museum specimens, as per circular enclosed. Yours very truly,

C. G. LLOYD,
Court and Plum Streets,
Cincinnati, Ohio.

ALLEN, MISS, Massachusetts:

Melanogaster ambiguus.

BARTHOLOMEW, E., Kansas:

Calvatia lilacina (a form with the peridium cracked into areoles).

BATES, Rev. J. M., Nebraska:

Hirneola auricula-Judae, Irpex (cfr. tulipifera), Polystictus (unknown to me), Polystictus hirsutus, Polyporus gilvus, Irpex (sp.).

BOGUE, E. E., Agricultural College, Michigan:

Thelephora Schweinitzii (? young), Isaria (?).

BRAENDLE, F. J., Washington, D. C.:

Polyporus rufescens, Pterula (sp.)
Hydnum pulcherrimum, Xylaria (conidial state).

BRENCKLE, Dr. J. F., North Dakota:

Tylostoma mammosum, Morchella esculenta, Lenzites saepiaria, Calvatia caelata, Fomes fomentarius, Physarum (sp.).

DALLAS, MRS. GEO. M., Pennsylvania:

Daedalea juniperina, Polystictus pergamenus, Guepinia spathulata.

DAVIS, SIMON, Massachusetts:

Polystictus cinnamomeus, Polystictus cinnabarinus, Irpex pachydon (A little known plant in Europe—more common in this country where it is called Irpex crassus.) The only figure (Gillet) is very *badly colored.* It is a white plant. I found it only once in France. Around Cincinnati it is more frequent and surely the same), Hydnum adustum, Polyporus lucidus, Polyporus elegans, Daedalea confragosa, form Trametes rubescens, Polyporus rufescens, Lachnea helvelloidea (spores, elliptical, smooth, 12 x 24, with a large gutta), Lachnea macropus?, Polyporus.

Polyporus elegans, Polystictus cinnabarinus, Polyporus (unknown to me), Polystictus pergamenus.

DENNISTON, R. H., Wisconsin:

Fomes (cfr. conchatus), Fomes salicinus (?), Fomes ribis (?), Fomes conchatus, Fomes ignarius (3 collections), Fomes Everhartii (3 collections), Fomes pinicola (pale form), Fomes pinicola (dark form on hemlock), Fomes

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pinicola (typical form, but these grew on birch), Fomes Ohiensis, Daedalea unicolor, Fomes roseus, Polyporus dichrous, Trametes obtusus, Daedalea confragosa (marked form), Daedalea confragosa (another form), Fomes leucophaeus, Favolus europaeus, Fomes fomentarius, Merulius tremellosus, Fomes connatus, Polystictus pergamenus, Favolus rhipidium, Polyporus lucidus, Lenzites trabea, Polyporus frondosus, Polyporus giganteus.

DOBBIN, FRANK, New York:

Daedalea confragosa, Odontia lateritia (Phlebia hydnoidea is said to be an earlier name, but it is not a Phlebia, and lateritia is a much better specific name. It is a fine chance, however, for a "new combination"), Daedalea quercina, Polyporus adustus, Odontia (unknown to me), Lenzites saepiaria, Polyporus gilvus, Hydnum pulcherrimum, Fomes connatus (resupinate, said to be Poria obducens), Stereum.

DUPRET, H., Canada:

Lepiota naucina, Stereum sericeum, Stereum (Hym.) tabacinum, Gyromitra esculenta, Polystictus versicolor, Craterellus cornucopoides, Mycelium (probably of a Polyporus, forming a thick, matted layer).

FINK, PROFESSOR BRUCE, Ohio:

Poria (yellow when fresh), Stereum complicatum, Corticium Oakensii (?).

FISHER, G. C., Ohio:

Lenzites betulina, Scleroderma Cepa, Lycoperdon cruciatum, Lycoperdon (sp.), Polystictus focicola (This species is usually, but erroneously, known in American mycology as "Polystictus parvulus, Klotz"), Polystictus focicola (old, weathered).

Polystictus sanguineus, Polystictus (yellow—unknown to me).

FISHER, G. C., Florida:

Lenzites betulina, Fomes connatus, Crucibulum vulgare, Polyporus arcularius, Trametes (cfr. hispidus).

Auricularia (cfr. auricula-Judae) (Much larger and otherwise appears different from the usual form of this species), Lenzites saepiaria Geaster hygrometricus, Polystictus focicola, Fomes reniformis (spores are echinulate).

GRIFFITH, D., Florida:

Polyporus gilvus, Fomes zonatum.

HARD, M. E., Ohio:

Crucibulum vulgare, Poria tulipifera, Geaster minimus, Geaster rufescens, Stereum fasciatum.

HENDERSON, Dr. W. H., California:

Bovista pila (a very abundant collection), Bovista pila (a small uncolored form that only occurs on the Pacific coast), Bovista plumbea (abundant collection), Catastoma (sp.) a single specimen), Lepiota (sp. cfr. procera).

HOLDEN, CAPTAIN WM., Ohio:

Polyporus (White, anoderm. A species I have never been able to determine. Spores subglobose, 4-4½ x 5-6 with a large gutta.

Polyporus (cfr. Schweinitzii). Growing at base of pine tree.

HONE, MISS DAISY, Minnesota:

Morchella crassipes, Peziza repanda, Geoglossum Walteri, Morchella esculenta, Geoglossum hirsutum, Helvella infula, Helvella lacunosa, Lachnea scutellata, Sarcoscypha coccinea, Sclerotina tuberosa, Tympanis pinastri, Hymenoscypha cyathoidea, Karschia lignyota, Dasyscypha agassizia, Chlorosplemium aeruginoscens, Dermatea cerasti, Peziza vesciculosa, Bulgaria inquinans, Rhizina inflata, Verpa bohemica, Verpa conica, Spathularia flavida, Spathularia Neesii, Leotia lubrica, Gyromitra esculenta, Urnula Craterium, Morchella conica. These specimens are all as determined by Miss Hone.

HRDLICHA, Dr. A., Washington, D. C.:

Polyporus distortus (Very abundant and fine specimens), Polyporus gilvus, Fomes leucophaeus, Polystictus cinnabarinus, Polyporus dichrous, Polyporus (unknown to me), Polysaccum pisocarpium, Lycogala Epidendrum, Scleroderma Geaster (unopened).

Pyrenomycetes, Favolus europaeus, Thelephora Schweinitizii, Hydnum erinaceum, Bulgaria inquinans, Bulgaria rufa, Fuligo septica, Polyporus distortus (One an ordinary abortive specimen, the other unusually well developed. The latter is very similar to Polyporus rufescens of Europe or as known in France "Daedalea biennis," and strongly points to the conclusion that our American plant called P. distortus is an abortive form of P. rufescens).

HUNTINGTON, J. W., Massachusetts:

Polystictus conchifer.

JACKSON, H. S., Illinois:

Urnula Craterium, Stereum bicolor, Corticium, Stereum sericeum.

KELLERMAN, PROFESSOR W. A., Ohio:

Odontia lateritia.

KILLGORE, ANTHONY, New Jersey:

Xylaria polymorphum.

LAKIN, W. T., Maryland:

Poria mutans, Paxillus pannoides (?), Geoglossum glabrum (=G. simile, Pk. The paraphyses are not well shown either in Massee's or Cooke's figures, and the name as Peck has already pointed out is very, very bad for the plant), Polystictus cinnamomeus, Stereum sericeum, Fomes leucophaeus, Polystictus pergamenus, Polystictus versicolor, Cyclomyces Greenii (This is an extremely rare plant), Polyporus flavo-virens, Polyporus rutilans (Mr. Lakin's specimen has smaller pores than the plant that I found common in France, but they are the same species, I think, without question), Poria, Polyporus gilvus, yellow form (These specimens have the spore characters of fulvotinctus as pointed out by Mr. Murrill, but I consider them a form of gilvus. The type of fulvotinctus is a little fragment, totally inadequate to base a species), Irpex paradoxa?, Hydnum repandum?, Xylaria?, Morchella esculenta, form conica, Morchella conica, true, according to Boudier's plate, Morchella crassipes (as known in American mycology), Morchella (sp. unknown to me), Morchella (Sp. unknown to me, very peculiar with a slender stipe and small, globose head), Poria, Polystictus (cfr. tomentosus), Mutinus (eggs), Stereum fasciatum, Daedalea confragosa (very peculiar form), Lenzites corrugata, Thelephora Schweinitzii (?) (If it is not a different species it differs from the ordinary form of Thelephora Schweinitzii), Polyporus (cfr. squamosus) This differs from squamosus in its much stronger scaly pileus and meruloid pores), Fomes carneus, Gyromitra Caroliniana (A rare find. Not recorded, I think, since the days of Schweinitz), Xylaria polymorphum, Daedalea confragosa (Trametes form), Fomes graveolens, Polyporus Tsugae, Crucibulum vulgare, Leotia lubrica, Daedalea confragosa (brown, lenzitoid form), Favolus europaeus, Phallus egg. (This egg is contracted as is shown on page 83 Myc. Notes. I have several times noted dried phalloid eggs like that "strange phalloid egg" which puzzled me so much at that time. I am now convinced, as Mr. Long recently states, that its peculiar shape is due to uneven contraction in drying), Lenzites betulina, Hydnum vellereum, Gyromitra curtipes, Panus rudis, Polystictus pergamenus, Polystictus versicolor (unusual form), Hydnum (young, very?), Cantharellus cinereus, Hypoxylon, Daedalea unicolor, Urnula Craterium, Guepinia spathulata, Hydnum septentrionale, Clavaria pistillaris, Lenzites saepiaria, Hydnum adustum, Polystictus cinnabarinus, Polyporus, Schizophyllum commune, Panus stipticus, Fomes (young), Polystictus hirsutus, Polyporus elegans (unusually large specimens), Xylaria corniformis, Clavaria amethystina, Peziza (5 collections), Wynnea Americana (recently described).

LAUGHLIN, EMMA E., Ohio:

Polyporus lucidus.

LEHMAN, E. A., North Carolina:

Daedalea confragosa (form), (A most peculiar form of this extremely variable species. It is strongly rigid, zonate, and the pores have a yellow cast, the first I ever saw with a yellow cast.) Geaster hygrometricus (*Reddish*, so that at first I did not recognize it. Probably colored by the soil in which it grew), Schizophyllum commune, Urnula Craterium, Crucibulum vulgare, Cyathus Lesueurii (typical), Scleroderma aurantium.

MACKINTOSH, R. B., Massachusetts:

Stereum spadiceum, Fomes leucophaeus, Trametes sepium, Lycoperdon stellare, Lycoperdon Wrightii, Lycoperdon gemmatum (form), Lenzites saepiaria, Thelephora Schweinitzii, Lycoperdon muscorum, Scleroderma tenerum, Scleroderma aurantium, Daedalea confragosa, Polyporus lucidus, Hydnum adustulum (if it is really distinct from adustum), Polystictus cinnamomeus, Polyporus brumale, Trametes (cfr. serpens), Lycoperdon muscorum, Lycoperdon (cfr. piriforme), Lycoperdon (cfr. tessellatum), Lycoperdon (cfr. atropurpureum), Scleroderma Texense, Scleroderma Cepa, Hydnum Morganii (A much larger example than the types from Professor Morgan), Hydnum cristatum (or mirabile as Peck determines it), Hydnum (two species unknown to me), Polystictus (cfr. tomentosus).

NELSON, N. L. T., Missouri:

Thelephora Schweinitzii, Fomes fulvus, Polyporus gilvus, Polystictus perennis, Polystictus pergamenus.

Xylaria (conidial), Polystictus conchifer, Polystictus cinnabarinus, Lycoperdon piriforme, Stereum fasciatum, Myxomycetes.

Polystictus cinnabarinus, Stereum fasciatum, Fomes leucophaeus.

NOBLE, MRS. M. A., Connecticut:
Hypomyces Lactifluorum.

PIERCE, MRS. F. A., Massachusetts:
Polystictus cinnabarinus, Lenzites betulina, Lenzites sepiaria, Hydnum adustum, Daedalea confragosa, Lenzites corrugata, Daedalea quercina, Polystictus versicolor, Polystictus hirsutus, Polyporus (cfr. nidulans), Polyporus (cfr. nidulans).

PLEAS, C. E., Florida:
Geaster triplex (small form). I call this triplex, as it has the general appearance of triplex, although as to size it is Geaster saccatus. Scleroderma (A new species or rather a new form of S. Geaster. It grows densely caespitose and is very coarsely scaly). Geaster minimus (A very tiny little specimen), Scleroderma (sp.), Bovistella Ohiensis, Scleroderma flavidum, Geaster hygrometricus, Polystictus focicola, Lycoperdon cruciatum (peculiar form), Polystictus sanguineus, Polysaccum pisocarpium, Lycoperdon (sp.), Fomes Curtisii, Fomes Curtisii (abortive stems).

SHEPHERD, Dr. I. M., New Jersey:
Cyathus stercoreus.

SMITH, G. D., Ohio:
Peziza nebulosa (?), Merulius (sp. unknown to me), Lycoperdon gemmatum, Clavaria pyxidata, Tremella fusiformis (The first time I have seen it. It has the "basidia" of the genus Tremella, but in general appearance is quite different from all others I know. It is white and may be compared to a large, gelatinous Clavaria cristata. The branches of this specimen are much sharper than shown in Atkinson's picture).

Polyporus arcularius, Favolus europaeus, Peziza.

Wynnea Americana (The first time I have received this rare plant). Hydnum adustum, Calvatia elata (In sphagnum moss. The most western station I have known).

SPAULDING, PERLEY, New York:
Polystictus abietinus, Fomes roseus (on Picea rubra), Polystictus pergamenus (on Betula), Fomes pinicola (on Picea and on Tsuga), Trametes abietis (on Picea), Polystictus versicolor (on Prunus), Favolus europaeus (on Acer), Poria (unknown to me), Fomes ignarius (?) resupinate, on Betula), Fomes leucophaeus (?, infested with some parasitic species that has turned the context white).

TRUE, Dr. H. L., Ohio:
Hydnum (cfr. adustum).

WESTGATE, J. M., California:
Podaxon Farlowii (The only species of Podaxon known from the United States).

WHETSTONE, Dr. M. S., Minnesota:
Polyporus squamosus, Tremella foliacea (as I suppose), Pleurotus nidulans, Morchella conica (true, I think, or Morchella angusticeps, which appears to me very much the same thing), Morchella Bohemica (or Verpa Bohemica, as often called. Called also in this country Morchella bispora

but the type form in Europe is also "bispored"), Bovista Pila, Favolus europaeus, Ustulina vulgaris, Scleroderma Cepa. Peziza, Xylaria polymorphum, Spathularia flavida, Lycoperdon polytrichum.

Polystictus cinnabarinus (2 collections), Hypoxylon, Hydnum, Lycogala epidendrum, Polyporus resinosus, Polyporus picipes, Lycoperdon pulcherrimum, Fomes connatus, Panus, Fomes leucophaeus, Corticium (?), Polystictus cinnamomeus, Pterula multifida, Xylaria, Hydnum adustum, Polyporus elegans, Polystictus versicolor, Schizophyllum commune, Geoglossum (2 collections), Cyathús vernicosus, Clavaria, Helvella, Clavaria cinerea, Xylaria, Stereum (cfr. spadiceum), Lycoperdon cruciatum, Urnula Craterium, Polyporus (unknown to me), Hydnum ochraceum) Xylaria, Polyporus pubescens, Polystictus hirsutus, Fomes roseus), Helvella, Lenzites betulina, Lenzites trabea (truly mesopode and the first specimen I have so seen), Polyporus gilvus, Favolus europaeus, Favolus (cfr. europaeus), Stereum spadiceum, Thelephora, Xylaria, Polystictus pergamenus, Tremella foliacea, Boletinus porosus, Polyporus arcularius, Polyporus brumalis, Thelephora. (2 collections), Cantharellus.

WILCOX, Gen. T. E., Washington, D. C.:

Scleroderma Cepa.

PLANTS RECEIVED DURING SEPTEMBER, 1907:

ALLEN, MISS L. C., Massachusetts:

Trametes rubescens, Lenzites corrugata, Irpex cinnamomeus, Polystictus versicolor, Polystictus velutinus, I think. (The mouths of the pores are yellowish, hence a satiny effect as you view them from different angles. This is the distinction I make between the plant and versicolor.) Polystictus conchifer, Daedalea quercina, Polystictus cinnabarinus, Polyporus adustus, var, carpineus (At least it seems to agree with Sowerby's figure. It is a rare form, thin, yellowish and soft, velvety pileus), Lycoperdon (cfr. muscorum) on a pine cone, Scleroderma Cepa, Peziza (cfr. Acetabulum).

BATES, REV. J. M., Nebraska:

Polystictus versicolor, Pistillaria Batesii (Co-type specimens!).

BENSON, BERRY, Georgia:

Amanita solitaris (A "button" with a stem 2¾ inches thick, 8 inches high).

BLACKFORD, MRS. E. B., Massachusetts:

Polyporus betulinus, Hygrophorus ruber, Hypoxylon coccineum, Coprinus, Lenzites betulina, Polyporus brumalis, Polyporus elegans, Naucoria Christianae, Stereum spadiceum, Hydnum Earleanum (very ?), Polyporus adustus, Polyporus adustus (young), Cordyceps capitata, Polyporus volvatus, Poria (? undeveloped), Hydnum repandum, Boletus Roxanae (as labeled), Trametes pini (poorly developed), Polyporus caesius (Bright blue when young), Fomes connatus, Stereum rubiginosum, Polyporus lucidus, Daedalea confragosa, Urnula Craterium, Peziza, Leotia chlorocephala (as labeled), Polyporus (unknown to me), Cyclomyces Greenii (Formerly supposed to be a very rare plant, but it has reached me a number of times), Polyporus griseus (Sent as leucomelas. Whether or not it is the same as the European species, I do not know, as I am unacquainted with the latter), Trametes abietis (a form of pini), Daedalea unicolor, Leotia chlorocephala (as labeled, with ~~yellow stems~~), Daedalea quercina, Clavaria (?), Hydnum velereum (?), Cyathus stercoreus, Merulius lacrymans.

BRANDEGEE, T. S., Mexico:

Catastoma circumscissum (Same exactly as the U. S. forms).

COONS, G. H., Illinois:

Calvatia rubroflava (in a garden), Scleroderma Cepa, Geaster rutilans, Scleroderma tenerum, Helvella crispa, Fomes connatus, resupinate (probably), Crucibulum vulgare, Poria tulipifera, Bovistella Ohiensis, Stereum fasciatum, Polyporus adustus, Fomes reniformis, Polyporus (unknown to me).

DAVIS, SIMON, Massachusetts:

Lenzites corrugata (?) (pigmy, if true), Hydnum caespitosum (?), Panus stipticus, Scleroderma Cepa, Daedalea unicolor, Daedalea quercina, Favolus europaeus, Polyporus betulinus, Polystictus conchifer, Polystictus pergamenus, Polystictus velutinus (?), Calvatia elata?, Polyporus (Two species unknown to me).

DONOR UNKNOWN, United States:

Lycoperdon stellatum, Clavaria pistillaris, Clavaria (sp.).

EDGERTON, C. W., New York:

Polystictus pergamenus, Polyporus elegans, Polystictus hirsutus, Favolus europaeus (one specimen an unusual form), Daedalea quercina, Fomes connatus, Polyporus (sp. unknown to me), Polystictus versicolor, Polyporus adustus, Polystictus cinnabarinus, Daedalea confragosa, Hydnum Morganii (?), Polyporus gilvus, Fomes fomentarius, Fomes leucophaeus, Trametes suaveolens.

FESSENDEN, GEO. B., Massachusetts:

Lysurus borealis (Nicely dried specimen).

FISHER, G. C., Florida:

Geaster hygrometricus, Bovistella Ohiensis, Lycoperdon cruciatum (old), Scleroderma Cepa (?), Mutinus Ravenelii ?.

GARMAN, PROFESSOR H., Michigan:

Tylostoma campestre.

HANMER, C. C., Connecticut:

Mutinus elegans (Fresh eggs. In transit one of them developed, breaking a hole through several thicknesses of tissue paper in which it was wrapped, showing the strength that phalloids have in development). Polyporus tsugae.

HARD, M. E., Ohio:

Leotia lubrica, Cordyceps militaris.

HAY, G. U., New Brunswick:

Polyporus adustus, micro-fungus, very curious structure, Myxomycetes, Hydnum aurantiacum?, Corticium amorphum, Helotium citrinum, Polyporus picipes, Boletinus palustris, Stereum tabacinum, Fuligo septica, Cantharellus tubaeformis, Thelephora terrestris, Xylaria polymorphum, Stereum fasciatum, Polyporus elegans (unusually large specimen), Polyporus (unknown to me), Polystictus hirsutus, Merulius tremellosus, Fuligo ochracea, Lycoperdon cepaeforme, Helvella lacunosa, Hydnum zonatum, Fomes roseus, Peziza Acetabulum (or close), Trametes abietinus, Polyporus caeruleoporus—"Very rare and local, under spruce trees, but one station known here."—G. U. Hay. (It is the first time I have received it), Marasmius, Lenzites betulina, Polyporus (on Polytrichum, sp. unknown to me.).

HILL, ALBERT J., Canada:
Daedalea confragosa.

HOLDEN, CAPTAIN WM., Ohio:
Polyporus robiniophila.

HRDLICHA, DR. A., Washington, D. C.:
Scleroderma Geaster, Polyporus gilvus, Stereum frustulosum, Polyporus distortus.

HUMPHREY, C. J., New York:
Lenzites betulina, Polystictus conchifer, Stereum fasciatum, Lenzites trabea, Lenzites saepiaria, Merulius tremellosus, Polyporus galactinus (?), Polyporus (sp.), Polyporus adustus, Fomes leucophaeus, Phlebia radiata, Stereum sanguinolentum.

HUNTINGTON, J. W., Massachusetts:
Polystictus hirsutus, Polyporus elegans, Polyporus (sp. unknown to me), Polystictus cinnabarinus, Polyporus sulphureus, Fomes connatus (nice specimen), Polyporus Schweinitzii (Mr. Huntington says "Very common." It reaches me very rarely.), Fomes leucophaeus, Lenzites betulina, Lenzites saepiaria. "Thelephora dendritica," as it has been determined by Cooke for Morgan. No such species published unless Cladoderris dendritica is intended, to which it has no resemblance.

JONES, MISS KATE A., New Hampshire:
Polystictus perennis, Polystictus versicolor, Daedalea unicolor, Lenzites betulina.

KELLERMAN, PROFESSOR W. A., Ohio:
Fomes leucophaeus, Polyporus gilvus, Fomes fomentarius, Fomes graveolens, Poria mutans, Polyporus lucidus, Polyporus lucidus (As always considered in American mycology, but so different in its nature and development that I think it will some day have a distinctive name.), Polystictus biformis, Hydnum adustum, Polystictus (sp.), Fomes salicinus (In the sense of Morgan at least.), Fomes rimosus, Cyathus striatus, Polyporus (Unknown to me), Polyporus pocula (This plant reached Montagne from French Guiana, and he discovered it was a "new species." The fact not having been published, however, it was omitted from the recent compilation of alleged synonyms that were gathered together).

Note.—Packages were also received from the following correspondents: Laughlin, Emma E., Ohio; Miller, James, Ohio; Morgan, Professor A. P., Ohio; Noble, Mrs. N. A., Connecticut; Pleas, C. E., Florida; Smith, G. D., Ohio; Sterling, E. B., New Jersey; Vroom, J., New Brunswick; Walker, Isabel, M., Canada. Detailed acknowledgment will be made in the next letter.

LETTER No. 17.

Cincinnati, Ohio, November 1, 1907.

List of specimens received from Europe and foreign countries since the last report, May, 1907.

We list the plants here under the names as we have labeled them in the museum at the time they were received. Some of the species received from foreign countries, where the subject is little known, do not have names, or impress us as being marked forms or varieties of known species. In these cases we think it is better to not specify the plants by definite names until we make a comparative study of the subject in connection with other forms known from these countries.

I beg to thank my correspondents for the very liberal contributions they are making to the museum. All specimens received are carefully labeled and systematically preserved. My publications are sent to those who favor me with specimens, and I trust are a partial return for their trouble.

Yours very truly,

C. G. LLOYD,

(Klincksieck) No. 3 rue Corneille (Odéon),

Paris VI, France.

ACLOQUE, A., France:

Bovista nigrescens.

ASTON, P. C., New Zealand:

Cyathus stercoreus.

BAKER, R. T., Australia:

Catastoma anomalum (Sent in formalin, and some are an inch in diameter. It is much larger than I had supposed this species grew).

BARBIER, M., France:

Fomes conchatus (Growing on the horn-beam (Charme), Lenzites abietina, on Aesculus hippo.), Polystictus velutinus (?).

BEZZI, PROFESSOR M., Italy:

Polyporus perennis, Polystictus hirsutus, Polystictus versicolor (typical, on Robinia), Trametes suaveolens (on Salix), Polyporus amorphus (in moss), Trametes hispida (on Salix, said now to be Trametes lutescens of Persoon), Polyporus hispidus (on Tamarix, hence I suppose it is Polyporus tamaricis if that is different from hispidus), Polystictus (unknown to me, on Robinia), Polyporus lucidus, Polystictus (unknown to me, on Robinia), Polystictus (same as preceding, but on alder).

BLANDENIER, PROFESSOR A., Egypt:

A saprophytic phaenogam.

BRACE, L. J. K., Bahamas:

Clathrus—egg (Unable to identify the species, but it belongs to the Clathrus section), Reticularia Lycoperdon, Hirneola auricula-Judae.

BRANDEGEE, T. S., Mexico:

Holocotylon mexicanum (We have labeled these specimens with a new name, for they do not appear to be the same as either of the species described on page 254 and 255 of Myc. Notes. The peridium is so

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thin that the gleba mass appears naked at first view. The spores are small, 4 mic., and do not have the strong pedicels of the other two known species. At the same time it is hard to decide as to the specific value of these "species" of Holocotylon from the few collections that are known).

BREITUNG, REV. A., Denmark.

Fomes Pfeifferi (Compared with the type specimens, and I think surely the same, though this grew on beech and the species was described from Abies. Characterized by the strong resinous pileus (which looks like a piece of resin) and verrucose spores. Rev. Breitung sends it under the name resinosus, a name as a Fomes I can not trace. There is a Fomes resinaceus which has much paler context and smooth spores.), Fomes fomentarius, Fomes annosus, Fomes ribis.

BUTLER, E. J., British India:

Podaxon pistillaris (Agrees well with the type in the Linnean herbarium which came originally from India), Scleroderma aurantium (same as the European plant), Tylostoma (cfr. squamosum), Lycoperdon piriforme, Geaster (unopened, unnamed I think. Closest to Geaster Scleroderma, cfr. Myc. Notes p. 316), Lycoperdon pusillum (We have to so refer it, though it is larger than the European plant. Excepting the size, however, we find no character on which we could base a species), Cyathus Poeppigii (though the peridioles are sterile I do not question the species), Geasters (unopened, velutinus section), Lycoperdon (close to gemmatum), Scleroderma verrucosum (caespitose form. I have gotten the same form before from India), Tylostoma (4 collections), Cyathus limbatus (?) It has the same characters as limbatus, but not the habits. It resembles Montagnei as to habits, spores 7-9 x 16-20), Scleroderma Cepa.

CAVARA, DR. FR., Italy:

Scleroderma Bovista. In the sense of Dr. Hollós and of Fries (?).

CAVE, GEO. H., British India:

Scleroderma columnare (A strongly marked species of Scleroderma with a slender stem, well named columnare. It is known only from India and Ceylon), Scleroderma (species not sure).

DAMAZIO, L., Brazil:

Polyporus, Fomes, Polystictus. (These specimens all unknown to me. All strongly marked, and easily recognized if I knew the foreign polyporoids.)

DRAPER, W., Egypt:

Fomes (Ganoderma).

EYRE, REV. W. L. W., England:

Polyporus melanopus.

FROGGATT, WALTER W., Australia:

Scleroderma Cepa (in a garden), Lycoperdon cepaeforme (in a paddock among grass under Sheouk (Cassaria) trees, Catastoma (Unnamed, new for Australia. Close to hyalothrix in general characters, but having very long pedicels), Mycenastrum Corium (Fine specimens. No one of my correspondents sends nicer or better specimens than Mr. Froggatt).

GILL, WALTER, South Australia:

Scleroderma flavidum (which seems to be the most common Scleroderma in Australia).

HAMILTON, A. G., New South Wales:

Polyporus arcularius, Thelephora (sp.), Polysaccum pisocarpium (form tuberosum), Polyporus (sp.), Lycoperdon (2 collections), Geaster, Scleroderma Cepa.

HAY, F., England:

Cyathus vernicosus, Lycogala Epidendrum, Calvatia caelata, Bovista nigrescens, Lycoperdon piriforme, Lycoperdon gemmatum, Lycoperdon gemmatum var. excipuliforme, Lycoperdon pratense, Scleroderma (immature), Lycoperdon spadiceum.

HILL, ALBERT J., British Columbia:

Fomes pinicola.

JAAP, OTTO, Germany:

Polystictus versicolor (9 collections), Lenzites betulina (3 collections), Polystictus euonymus, Polystictus perennis, Polyporus brumalis, Polyporus varius, Fomes applanatus, Fomes fomentarius, Daedalea unicolor, Polyporus adustus (3 collections), Daedalea quercina, Fomes annosus, Polyporus rufescens, Lenzites abietinus, Fomes fulvus, Poria rancida, Poria consobrina, Polystictus velutinus, Polystictus zonatus, Poria contigua, Fomes ignarius (3 collections), Poria mucida, Trametes subsinuosa, Poria subfuscoflavida, Polyporus fragilis, Polyporus crispus (?).

LORDLEY, E. D., Nova Scotia:

Morchella esculenta, var. conica.

MACHADO, A. D., Perak:

Polyporus (sp. unknown to me). Genus unknown to me (This is a most curious thing with a sclerotium, a long black stipe and a white, capitate head. I can not make out a hymenium, and, in fact, I am in doubt whether it is a fungus or not. I have sent it to Professor Patouillard for an opinion).

MENEZES, C., Madeira Islands:

Cyathus Poeppigii (Not as black as usual nor as strongly striate and spores are smaller (20 x 26).

MILLE, REV. L., Ecuador:

Arachnion Bovista (Doubtful if distinct from Arachnion album (cfr. Myc. Notes p. 253). This specimen has brownish gleba and the firmest peridium I ever noted on an Arachnion. Before I cut it I took it for Bovista plumbea), Bovistella echinella (This unique little species rarely reaches me (cfr. Myc. Notes p. 286). It was originally from Ecuador. The spores are described as smooth, but these were very *slightly* rough), Geaster triplex (An abundant and typical collection, save the endoperidium is darker than in our United States form), Lycoperdon polymorphum, Morchella (species unknown to me), Cyathus stercoreus (spores 32 x 36, subglobose), Cyathus stercoreus (A sub-cylindrical form. No spores found, but I do not question the species).

MILLEN, H., Tobago:

Clavaria (sp.), Lycoperdon Wrightii.

O'CONNOR, CHAS. A., Mauritius:

Phallus gracilis (the slender form of Phallus aurantiacus. Mr. O'Connor sends dried specimens and a drawing from which there is no trouble in identifying his plants. The pileus is acute (not truncated), otherwise the same as the Hawaiian plant), Scleroderma tenerum (Exactly the same plant that we have so common in the United States), Scleroderma tenerum (mixed with another species (?), Lycoperdon Wrightii (We have already recorded this plant in North and South America, Africa and Java. Its occurrence in Mauritius adds to our knowledge of its distribution), Lycoperdon pusillum (The largest specimens of this little species we have seen. Some were an inch in diameter, but as they have no sterile base we must call them pusillum, not cepaeforme, which at first sight they appear to be), Calvatia (undescribed) close to rubro-flava as to color of ripe gleba (we can not say as to the unripe) spores rough, and shape and habits entirely different.

PATTERSON, W. H., St. Vincent:

Lycoperdon pusillum, Lycoperdon Wrightii (Another station for Lycoperdon Wrightii which gives promise of encircling the world).

PETCH, T., Ceylon:

Almost nothing is known of the Gastromycetes that occur in Ceylon, but Mr. Petch has on several occasions sent me nice collections, and I hope in time, through his kindness, to get enough material so that a connected account of the Ceylonese forms can be given. In the last package are a number of new forms, but not, in my opinion, new species, though I do not question that each one of them would figure as a new species if sent to those who are hunting this kind of game.

Matula poroniaeformis (A curious genus allied to the Nidulariaceae. Through an error the genus was mentioned in Letter 13 under the name Michenera. While that letter was written at Barbizon away from text books and the plant listed under the name under which I received it, I should have known better, for I am acquainted with the genus Michenera and knew that it belonged to the Thelephoraceae and had no relation to Matula, though Berkeley confused it under two generic names, Michenera and Artocreas, both errors).

Cyathus striatus (form). Differs from the European plant in having larger, narrower, more scabrous cups and much smaller spores—7 x 12. The spores of the type form are 8-10 x 18-20, hence for those who base new species largely on spore measurements it is a marked species. I can see nothing in it, however, but a form of striatus.

Geaster coronatus (form). A most curious form that could well be made a new species, and certainly entitled to a name as a form of coronatus. The inner peridium has at its base a ring somewhat like the ring on Geaster Bryantii, which never occurs on the European plant.

Lycoperdon cepaeforme. Very close to the European plant, but differs in its larger mouth and general aspect and habits. The essential points—cortex, capillitium and spores—are the same.

Bovistella scabra (Myc. Notes, page 248, plate 70). A single specimen which is the same as the Australian species, excepting that I note the spores are slightly rough, and in the type they are smooth.

Bovistella (section Globaria). A single specimen sent with the preceding but a different species, I think. This has no sterile base, different cortex and larger pedicels.

READER, F. M., Australia:

Polystictus oblectans, Tremella mesenterica, Poronia punctata, Scleroderma (Peridium like Cepa. Gleba light ashy gray. A comparative study of the Sclerodermas is much needed, and some day we hope to do this work), Polysaccum crassipes (More typical as to form than any specimen we had from Australia when we wrote the pamphlet on Australian puff balls), Tylostoma Purpusii, Crucibulum vulgare (A small form that appears to be quite frequent in Australia on manure), Clathrus gracilis (Mr. Reader writes me that in the Casterton district he has observed no phalloids. This specimen came from the Wimmera district).

RICK, REV. J., Brazil

Cyathus Poeppigii (No spores found, but feel rather sure of it), Cyathus (sp.) (No spores found, and I do not recognize the cups), Lycoperdon bonariense. (Rev. Rick says "bona species," but specimens are poor and I can not say.)

Tylostoma Berteroanum ("frequens in hortis stercoratis"), Arachnion album, Lycoperdon pusillum (or very close).

Geaster (An albino (?) of the pectinatus section.)

ROBERT, DOCTEUR, France:

Fomes rubriporus, Trametes pini, Polyporus lucidus, Polystictus hirsutus (form), Rhizopogon (sp. unknown to me), Trametes (?), Fomes ribis, Lycoperdon umbrinum (? old), Calvatia caelata (bright yellow form which very rarely reaches me).

ROLLAND, MONSIEUR, Corsica:

Polysaccum pisocarpium (globose form=tuberosum).

SCHUPP, REV. A., Brazil:

Clathrus chrysomycelinus ("Mycelium non semper aureum!")

SMITH, J. T. Tasmania:

Mycenastrum Corium (a nice specimen), Lycoperdon gemmatum (a fine cluster), Lycoperdon (I can not place. Root thick, cortex dark, gleba olive, cup deep, colored, spores apiculate, distinctly rough).

THOMSON, GEO. M., New Zealand:

Scleroderma (immature), Thelephora (?) fetid when fresh.

VAN BAMBEKE, DR. CH., Belgium:

Fomes applanatus, Polyporus hispidus, Polyporus sulphureus, Polyporus squamosus, Polyporus cuticularis.

VANDERYST, HYAC, Congo, Africa:

A fine lot of specimens from a section little represented in our museum. Six collections of Cyathus which we are particularly glad to get. The tropical Cyathi give promise of being the most puzzling proposition that we are working on. Hardly any two of them have the same sized spores.

Cyathus Poeppigii (typical). Spores 28 x 40.

Cyathus limbatus. Spores 10 x 20. This is the first record of the species, excepting in the West Indies, and it agrees very closely.

Cyathus limbatus (?). Another collection, spores a little broader, 12 x 20. The habits are not typical, but it is too close to separate.

Cyathus—close to pallidus as to cups, but larger spores (9 x 16) and not so large as triplex. The pallidus section of Cyathus, when we get many collections of it, will prove troublesome on account of the spore variation.

Cyathus—close to Cyathus Montagnei. Spores 12 x 16-20. It does not have the mycelial pad at the base that we have associated with Montagnei.

Cyathus, surely the same as the preceding.

Lycoperdon guttatum, as I shall call it. It belongs to the polymorphum section, but has no sterile base. The peridium is reddish brown closely resembling Bovista brunnea. The cortex dries up in little areas as it often does in Lycoperdon cepaeforme. The capillitium is colored and typical of this section. The spores are 5-6 (larger than usual in this section) smooth, strongly apiculate, and have a character I never noticed before in Lycoperdon spores. They are guttate in a water mount, as are many spores of agarics.

Lycoperdon, a scanty collection which resembles Wrightii, but has colored capillitium. It has not the same cortex as pusillum.

Geaster (probably young saccatus).

Geaster velutinus (form). This is a new form to me of the variable species velutinus (cfr. Myc. Notes, p. 315). It is light colored (tropical forms usually are dark) and differs from the type form in having a *short* stipe at the base. It is a connecting form between Geaster velutinus and Geaster stipitatus. Mr. Vanderyst has sent more than thirty specimens, all unopened except one. Is it any wonder that when these unopened epigaean Geasters strayed into European mycologists they were made into a "new genus," Cycloderma?

YOSHINAGA, T., Japan:

Lycoperdon (unnamed). It grew densely caespitose and resembles Lycoperdon compressum of the United States in its size and habits. It belongs, however, to the Pratense section, and has hyaline capillitium. Gleba olive, spores slightly oval, 4 mic., apiculate and slightly rough). Cyathus minimus (which is probably, I think, the oriental form of Cyathus striatus. The spores are exactly the same, and it differs only in having small sub-even cups. There are, however, faint indications of striae in the cups.) Crucibulum vulgare (form) (Differing from the usual form in the cups which are not so cylindrical but more tapering. Also in having the cups only half full of peridioles so that at first sight it appears quite different. It is the first collection of this genus I have seen from Japan, and is well entitled to a name as a variety if not as a species. The spores and peculiar peridiole structure are exactly the same as the type form.) Crucibulum vulgare (not so old as other collection, hence more brownish). Cyathus stercoreus (which is the common Cyathus in Japan, and the only one that has heretofore reached me).

ZENKER, G., West Africa:

Lycoperdon pusillum, Cyathus Poeppigii.

PLANTS RECEIVED DURING SEPTEMBER, 1907:

CRADWICK, WILLIAM, Jamaica:

Clathrus crispus (This is a phalloid that has never been illustrated by a photograph, though Turpin seems to have given a fairly good cut of it).

DONOR UNKNOWN, New South Wales:

Scleroderma (It has the aspect to me of being something peculiar. The peridium is thin, yellow, wrinkled, smooth).

DUMÉE, PAUL, Switzerland:

Fomes officinalis (growing on Larix).

GREEN, ALBERT, Australia:

Stereum, Peziza, Corticium (?), Genus unknown to me. Fine collection of Stereum, Peziza, Corticium, etc., genera of which I am not at all informed as to the foreign species.

HAMILTON, A. G., New South Wales:

Scleroderma flavidum, Bovistella (genus ?) (Of a type unfamiliar to me. Gleba purplish. No sterile base. Capillitium long, intertwined, but I think separate threads. Spores globose, smooth, not pedicellate or even apiculate. Unfortunately a single specimen. Mt. Kembla. Old and does not show cortex characters. I know no puff ball that even approximates this combination of characters.), Clavaria, Polysaccum crassipes (more typical than usual from Australia), Polysaccum tuberosum (Globose, stemless form.), Aseroe Muelleriana (The broad limbed form, cfr. Phalloids of Australasia, page 18. It is the first specimen of this form I have seen. Heretofore I have only known Kalchbrenner's figure.), Geaster saccatus (Much deeper base than usual to the saccate exoperidium).

HINSBY, G. K., Tasmania:

New genus!! (Peridium double, the inner separate from the other, and of a felty nature. Dehiscence doubtful, both unopened. Gleba olive, a mass of powdery spores without capillitium. Spores hyaline, elliptical 7 x 12. I have seen at Kew unnamed specimens of this same genus, but not the same species. It belongs to a little known but interesting group of genera, characterized by elliptical, hyaline spores. This section includes Castoreum and Mesophellia and at least two other unnamed genera, now in my collection, from Australia. Also I would include Protubera of Brazil. The position of the group is doubtful. Some appear to be hypogaeal, though different in gleba structure from the Hymenogasters. Others—Castoreum—closer to the Gastromycetes, and Protubera has been doubtfully compared to phalloids.), Schizophyllum commune, two species of Polyporus.

KLINCKSIECK, PAUL, France:

Trametes hispida (on poplar, in the Pyrenees), Polyporus rutilans (on beech, Fontainebleau), Polyporus varius (Fontainebleau).

NOACK, F., Germany:

Polyporus fumosus (on willow), Lenzites betulina (This is typical betulina according to Fries' description—rigid, "firm." Compared to it the ordinary plant we call betulina is Lenzites flaccida), Geaster fimbriatum, Geaster Schmidelii, Polyporus (?) unknown to me, Geaster hygrometricus, Polyporus (unknown to me).

O'CONNOR, C. A., Mauritius:

Three interesting phalloids in alcohol: Phallus gracilis (The slender form of Phallus aurantiacus with an acute pileus. This is the only common species Mr. O'Connor finds in Mauritius, and it is undoubtedly a widely spread species in the tropics), Phallus indusiatus (The ordinary, typical form with coarse meshes to the veil and the broad, campanulate pileus. Mr. O'Connor found but a single specimen, but it is the most frequent species in most tropical countries), Phallus duplicatus (Very close to the form in the United States, but differs slightly in the nature of the reticulations of the pileus. We shall have an article in Mycological Notes shortly with an illustration showing this difference. This is the first time I think that Phallus duplicatus is recorded outside of the United States. Professor Fischer places this species with Phallus indusiatus, but could he see these two specimens from Mr. O'Connor side by side, I think he would concede the difference). This is the first record of either of these three species from Mauritius. The only phalloid heretofore recorded from this island is Simblum periphragmoides, which Mr. O'Connor has not yet found.

PANAU, CHARLES, France:

Polyporus squamosus (a fine, large specimen), Fomes nigricans (in the sense of Boudier), Polyporus fragilis, on pine stump, Polyporus Forquignoni (Very glad to get this, as it is the first specimen I have seen. As to color, texture, pores, and spores, it might be taken for a small central stiped specimen of Polyporus squamosus, but the stipe is *not* black, and the scales not so pronounced), Polyporus rufescens.

PATTERSON, W. H., St. Vincent:

Cyathus Poeppigii.

PAUL, J. T., Australia:

Lycoperdon pratense, Lycoperdon cepaeforme, Lycoperdon (cfr. cepaeforme, but with large sterile base cells), Bovistella scabra, Bovistella Australiense, Lycoperdon (cfr. piriforme), Lycoperdon, sp. (Gleba with a purplish cast), Geaster (probably minimus, old and large), Xylaria (sp.).

Note.—Packages were also received from the following correspondents: Petch, T., Ceylon; Pujuila, Jaime, Austria; Rick, Rev. J., Brazil; Schupp, Rev. F. A., Brazil; Tepper, J. G. O., South Australia; Thomson, Geo. M., New Zealand; Yasuda, A., Japan. Detailed acknowledgment will be made in the next letter.

Letter No. 18.

Cincinnati, Ohio, January 1, 1908.

List of specimens received from the United States and Canada during the ast four months of 1907, and a few that were crowded out of Letter No. 16.

We list these specimens as they may be known to us, though we claim no ritical knowledge of the subject other than concerning the Gastromycetes. We ave, however, a general knowledge of the names of fungi that occur in American terature.

Our thanks are extended to those who have sent specimens, and we continue solicit specimens suitable for museum specimens, as per circular enclosed.

Yours very truly,

C. G. LLOYD,
Court and Plum Streets,
Cincinnati, Ohio.

CONTINUATION FROM LETTER No. 16.

Emma E. Laughlin, Ohio:—Daldinea concentrica.

James Miller, Ohio:—Fuligo septica (nice specimen).

Professor A. P. Morgan, Ohio:—Mycenastrum Corium (collected by G. C. sher at Troy, O.), Polyporus robiniophila, Mutinus Ravenelii (Prof. Morgan, ho was very familiar with Mutinus elegans and its habits, told me that Ravenelii very distinct, not only in the general form, size, and shape of the plant, but in s habitats. Mutinus elegans is a woods plant, growing usually around or on rotten gs. This collection of Mutinus Ravenelii was made in an old corn field with ayey soil and no humus at all. The habitat of fungi, generally neglected by ycologists, is often the very best specific character a species has.

Mrs. M. A. Noble, Connecticut:—Fomes leucophaeus.

C. E. Pleas, Florida:—Polyporus sublilacinus? (Pores have a lilac tinge, but loubt if it is not gilvus), Fomes marmoratus on hickory (I have gathered it in orida only on this host), Bovistella Ohiensis (a common puff ball in the South), leroderma flavidum, Calvatia lilacina, Bovistella Ohiensis (with abnormal cor-x), Scleroderma Geaster, Lentinus lepideus.

G. D. Smith, Ohio:—Tremellodon gelatinosum, Hydnum Caput-ursi, Tremelloid nt related to genus Dacryomitra and Calocera (as to basidia), but departs from h genera otherwise. Has been identified for me in Europe as Dacryomitra ssoides, but this is surely wrong. Calvatia elata, Lepiota granosa, Polystictus nabarinus, Pleurotus niger, Fomes pinicola, Daedalea confragosa, Polyporus idus, Polyporus picipes, Polyporus dryophilus (?), Hydnum septentrionale on ech, Poria tulipifera, Polyporus adustus, Polyporus radicatus, Polyporus resinosus, dnum adustum, Polystictus biformis on elm, Polyporus (Apus Carnosi), Thele-ra Schweinitzii, Helvella, Polyporus Berkeleyi, Peziza hemisphaerica, Poly-us (unknown to me. Section Mesopus Carnosi. A dark plant with rather ge, shallow pores. Close to radicatus, but without its black stem), Pleurotus ulans, Lycoperdon subincarnatum, Polyporus (unknown to me. Yellowish

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when fresh, but turns red on bruising. Belongs I judge to Apus Carnosi. Perhaps young sulphureus), Lycoperdon cruciatum, Lycoperdon, form of gemmatum which has no valid name, but should have. It was called var. papillatum in Peck's excellent monograph, but this species of Europe evidently a very different plant. Panus conchatus, Helotium herbarum, Polyporus adustus, Polyporus (sp. unknown to me), Trametes sepium.

E. B. Sterling, New Jersey:—Polyporus flavo-virens, Sparassis spathulata (A fine specimen of a rare plant. It was named by Schweinitz, Stereum spathulata changed by Fries to Sparassis spathulata, and renamed by Peck Sparassis Herbstii It seems to me to be coriaceous rather than fleshy, hence a Stereum according to Fries' definition. It has the general aspect of a Sparassis, and differs in its general appearance from all other Stereums), Sclroderma Geaster, Lycoperdon tessellatum Hypomyces lactifluorum, Craterellus cornucopoides, Peziza vesiculosa, Lycogala epidendrum, Daldinea concentrica, Crucibulum vulgare, Lycogala flavo-fuscum Polyporus gilvus (abnormally developed on a small branch. It encircles the branch and takes a thin, conchoid form), Myxomyces (plasmodium), Favolus europaeus Bulgaria rufa, Thelephora Cladonia, Polystictus cinnamomeus, Geaster hygrometricus, Fistulina hepatica, Polyporus brumalis, Hirneola auricula-Judae, Lenzites betulina, Polystictus versicolor, Polyporus (unknown to me), Scleroderma flavidum Scleroderma Cepa, Scleroderma verrucosum (not typical), Scleroderma tenerum Scleroderma aurantium.

J. Vroom, New Brunswick:—Polyporus caeruleoporus (very rare plant. "When fresh as blue as any Cortinarius I ever saw."—J. Vroom.)

Isabel M. Walker, Canada:—Gyromitra esculenta (?), Fomes Ieucophaeus, Fomes fomentarius, Fomes nigricans (in sense of Boudier) (of Fries?), Xylaria polymorphum, Morchella (sp.), Stereum fasciatum, Daedalea unicolor, Panus rudis, Daldinea concentrica, Panus (sp.), Polystictus cinnamomeus, Polyporus elegans, Polystictus hirsutus.

Received September, October, November and December, 1907.

Miss Lizzie C. Allen, Massachusetts:—Calvatia rubroflava, a rather rare and our only **truly yellow** puff ball. Lysurus borealis. Another station (Newtonville, Mass.) for this phalloid.

Frank H. Ames, Massachusetts:—Lenzites corrugata, Fomes leucophaeus, Polystictus pergamenus, Lenzites betulina, Lycogala Epidendrum, Poria Tulipifera, Genus unknown to me. Spores globose, hyaline, smooth, 4 mic. Conidial Pyrenomycetes?.

Mrs. E. B. Blackford,—Polyporus caesius.

Fred J. Braendle, Washington, D. C.:—Tricholoma equestris (aurea), Tricholoma transmitans (argentea). Both of these plants are edible and largely employed as food in the vicinity of Washington. Mr. Braendle is doing good work in disseminating, locally, popular knowledge of the edible species of agarics about Washington.

T. S. Brandegee, California:—Gyrophragmium decipiens, Geaster hygrometricus, Calvatia occidentalis, Tylosoma albicans, Calvatia (unnamed). It belongs to a type departing from all others known. Cortex a thin membrane, breaking up into areas. Peridium reddish brown, brittle. (None of the plants have dehisced, but from the nature of the peridium it is evident it breaks in fragments in dehiscence.) Sterile base none, but the plant is contracted at the base, not globose as are almost all puff balls that have no sterile bases. Gleba dark umber. Capillitium branched threads, but in the ripe gleba broken up into little fragments, deeply colored, from three to eight mic. thick. (This is the type of capillitium one finds in Calvatia caelata, very different from the true typical capillitium of the genus Calvatia.) Spores globose, 4 mic. in diameter, almost smooth but very slightly rough. Plant from two to three inches in diameter, growing in woods earth in the Giant Forest, Tulare County, California.

Professor T. S. Brandegee, Mexico:—Lycoperdon pseudogemmatum, Scleroderma (cfr. Cepa), Pyrenomycetes (Genus unknown to me). Daldinea concentrica.

Dr. J. F. Brenckle, North Dakota:—Polystictus conchifer, Lycoperdon Wrightii, Lycoperdon cepaeforme, Geaster limbatus (typical). Myxomyces.

Dr. J. F. Brenckle, Wisconsin:—Lycoperdon piriforme (young), Polystictus hirsutus, Lycogala Epindendrum, Polyporus (unknown to me), Scleroderma Cepa, Daedalea unicolor, Lycoperdon piriforme, Lycoperdon gemmatum.

Chas. O. Chambers, Oregon:—Geaster giganteus, Bovista Pila, Bovista plumbea, Lycoperdon subpratense. (These specimens do have colored capillitium!! in which character alone the American plant seems to differ from the European Lycoperdon pratense.)

Simon Davis, Massachusetts:—Lenzites betulina, Polyporus brumalis, Polyporus (sp.), Polpstictus hirsutus, Corticium (sp.), Hydnum ochraceum (subresupinate) Polyporus dichrous, Calvatia elata, Schizophyllum commune, Polyporus brumalis, Hydnum (resupinate).

Miss Alice Eastwood, California:—Bovista Pila (on the road to Yosemite,), Mycenastrum (?), species (?) Probably new. Closest relation is to Mycenastrum fragilis as the specimen exists at Paris. Has same spores and capillitium, but, like that specimen, the capillitium is devoid of the peculiar spines characteristic of the type species of Mycenastrum Corium. Miss Eastwood found the specimen at Tioga Lake, Yosemite National Park.

E. P. Ely, Minnesota:—Polyporus Schweinitzii (a rather rare species), Polystictus cinnabarinus, Polyporus gilvus var. scruposus, Polyporus adustus, Daedalea unicolor, Polystictus hirsutus.

Professor W. G. Farlow, New Hampshire:—Nidularia pisiformis.

G. C. Fisher, Florida:—Polystictus focicola, Lenzites rhabarbarina (only a bright colored southern form of saepiaria), Polyporus (unknown to me), Stereum subpileatum, Polystictus abietinus, Polystictus conchifer, Corticium (sp.), Lenzites Corrugata, Polyporus fumosus, more ligneous than northern 'forms. Polystictus barbatulus, Tremella, (cfr. mesenterica), Lenzites betulina, Geaster hygrometricus, Lenzites saepiaria. Fomes carneus (?), Stereum fasciatum, southern form. Differs some from the usual northern. Stereum (sp.), Rhizopogon rubescens, Amanita, coccinea. Irpex cinnamomeus, Polyporus gilvus, Polyporus (cfr. caesius), Stereum caperatum, Stereum subpileatum, Stereum versicolor, Stereum complicatum. Better developed and not so "complicate" as more northern forms. Merulius tremellosus, Tylostoma Floridanum, Lycoperdon piriforme, Geaster annulatus, as I shall call it. It is a new form or apparently a very distinct species. It has a ring at the base of the endoperidium as does Geaster Bryantii of Europe, but has an even mouth (sulcate in Bryantii). This is the third species or form characterized by a similar ring that has reached me. (Cfr. also Geaster coronatus, form, of Ceylon, Letter No. 17.) Lycoperdon cruciatum, Geaster hygrometricus (unopened), Stereum complicatum, Polyporus adustus, Stereu mochraceoflavum (Beautiful, fresh specimens), Tylostoma albicans, Clavaria, Thelephora terrestris, Polystictus versicolor. Cyathus stercoreus, Cauloglossum transversarium, Merulius Corium, Polyporus arculariellus, I think. It is very close to Polyporus arcularius, but very small and has a setiform stem. Bovistella Ohiensis, Scleroderma Geaster, Polystictus versicolor? An abnormal scutellate form. Merulius? White. Species unknown to me and genus uncertain. Either Merulius or Poria. Poria (sp.), Tylostoma albicans, Phallus duplicatus, Phallus Ravenelii, Lentinus Berterii? Polystictus hirsutulus. Too close to Pol. versicolor. It is the plant I have referred several times to Polystictus velutinus (?). Schweinitz's specimen is small and scanty, but, knowing the form, I think I recognized his specimen as what I have been calling "Pol velutinus?" I am glad to get a name for it. Geaster saccatus, form with dark endoperidium, Geaster saccatus with pale endoperidium, Scleroderma Cepa, Rhizopogon (sp.).

Dr. W. M. Glatfelter, Missouri:—Morchella esculenta, Thelephora palmata, form Americana (as named, but same form grows in Europe), Helvella elastica, Peziza vesiculosa, Stereum fasciatum, Craterellus cantharellus, Bulgaria rufa, Hydnum erinaceum, Stereum spadiceum, Stereum complicatum, Merulius tremellosus, Polyporus Spraguei, Hirneola auricula-Judae, Hydnum imbricatum, Peziza badia, Hydnum zonatum, Xylaria flabelliformis, Xylaria polymorpha, Craterellus cornucopioides, Stereum diaphanum, Irpex pachylon, Thelephora vialis, Sebacina pallida, better known as Thelephora Schwenitzii in American mycology, and as I have always called it. As we were all informed by Bresadola years ago, it does not belong to the genus Thelephora. The name Tremellodendron has been proposed for the section of Sebacina with erect habits, but as the best authors do not separate the incrusting from the erect species of Thelephora, I can not understand how they can consistently adopt different views as to Sebacina. The form that Dr. Glatfelter sends was by Schweinitz himself called "Thelephora cristata Fr." as evidenced in his herbarium, but is certainly only a form of his own "Thelephora pallida." Sebacina merismatoides, as is evident from the general nature of the plant, this belongs to the same genus as the preceding, though put in Clavaria by Schweinitz and in Pterula by others. Professor Burt tells me it has the same "basidial structure" which Bresadola first informed American mycologists was characteristic of the preceding plant. Scleroderma aurantium, Scleroderma tenerum, Scleroderma Cepa, Poria obliquus, Irpex cinnamomeus, Fomes rimosus (?), Xylaria (sp.).)

Miss Daisy Hone, Minnesota:—Morchella esculenta, Peziza fusicarpa, Plicaria repanda, Sarcoscypha coccincea, Verpa bohemica, Urnula Craterium, Leotia lubrica, Morchella conica, Sclerotina tuberosa, Dermatia cerasti. All the preceding are as determined by Miss Hone. Helvella lacunosa, Polyporus gilvus (form), a very peculiar form, thin rugulose, more yellow than usual. Hydnum Caputursi, Favolus europaeus, mixed with "Favolus microporus n. s." which is only a small-pored form of it. Scleroderma Cepa, Polystictus hirsutus, Polystictus pergamenus, Polyporus betulinus, Calvatia craniformis, Hydnum coralloides (?), Polystictus pergamenus (?), Fomes connatus, on ironwood (usually it is on maple), Polystictus cinnabarinus, Fomes leucophaeus, Panus rudis, Trametes obtusus, Polystictus (cfr. pubescens), but too yellow, Geaster limbatus, with the exoperidium inclined to become fornicate, Daedalea confragosa, Irpex lactea (?), Daldinea concentrica, Polystictus perennis, Polystictus pubescens, Polystictus versicolor.

J. W. Huntington, Massachusetts:—Polystictus (unknown to me). It has the same color, pores, texture, and peculiar colored setae as Polystictus circinatus and is closely related. The pores are, however, decurrent to the base of the stem, and it grew on an "oak stump." Polystictus circinatus and its allies are pine woods species and have no business to grow on oak stumps. Polyporus elegans, Fomes fomentarius, Merulius tremellosus, Daedalea quercina, Polystictus velutinus (?), Panus levis, a rare plant. I think the first time I have received it. It grew on an apple tree. Polyporus radiatus, young. Polyporus adustus, Daedalea unicolor, Polyporus Schweinitzii, Hydnum coralloides, Daedalea confragosa, Polyporus brumalis, Polyporus fumosus, Panus stipticus, Stereum spadiceum.

Miss Kate A. Jones, New Hampshire:—Bovistella pedicellata, Lycoperdon cruciatum, Polystictus pergamenus, Daedalea unicolor, Polystictus perennis, Polyporus brumalis, Lycoperdon piriforme, Polystictus cinnabarinus.

Ernest Knaebel, Colorado:—Polystictus circinatus, Polystictus versicolor (very ?). Referred doubtfully as a form of versicolor for the time being. I am satisfied in time it will bear another name. It is smoother, more uniform in color, more rigid than versicolor. Poria, species unknown to me, Polystictus pergamenus, Stereum rufum, Polystictus hirsutus (very ? form. Thicker, more conchoid, not so strongly hirsute), Polyporus (unknown to me), Daldinea concentrica, Fomes igniarius, Fomes pinicola, Lenzites sepiaria, Fomes roseus (on birch and the first I have received on frondose wood. It is generally on acerous wood), Lycoperdon elegans (found by Mr. Knaebel at an elevation of 8,500 feet, near Mt. Evans). In my article on American Lycoperdons I have considered this species as a large form of Lycoperdon umbrinum. But one specimen was known, in Professor Morgan's collection, and I did not feel like maintaining a species on this one specimen. I am convinced from Mr. Knaebel's specimens that it merits distinction. The species is much larger and more robust than any true Lycoperdon we have in our Eastern States. The cortex which is absent from Morgan's specimen is distinctive and the gleba does not turn purple in the ripest specimens. Lycoperdon (unnamed). Its relations are entirely with Lycoperdon Wrightii. Has same habits, spores and thick, flaccid, septate capillitium, but is a larger plant and capillitium is colored. Lycoperdon, same plant as preceding, but with abnormal cortex, Lycoperdon pusillum, with nodular cortex, Lycoperdon (cfr. cepaeforme), very similar but arger cells to sterile base.

E. R. Lake, Oregon:—Polyporus picipes, Xylaria.

Thomas Langton, Canada:—Tremella frondosa (or foliacea, I do not know exactly what the difference is). Mr. Langton writes me that he has observed large specimens that branched so as to spread over at least a foot. Polystictus versicolor, Stereum hirsutum (?), Fomes fomentarius, Poria (sp.), Polyporus rutilans, Daedalea unicolor.

Miss Emma E. Laughlin, Ohio:—Schizophyllum commune, Geaster triplex (typical), Stereum fasciatum (an abnormal specimen that forms a perfect cup. Had it been sent in olden times to one of our European mycologists, it would without doubt have been a "new species" belonging to the mesopodal section).

George E. Morris, Massachusetts:—Polyporus caesius, Daedalea confragosa, Fomes connatus, Polyporus radicatus, Cyathus stercoreus, Polystictus perennis, Peziza, Polystictus hirsutulus (if not a form of P. versicolor), Polyporus picipes, Polyporus rutilans, Polyporus flavovirens, Polyporus (sp. unknown to me). I have collected the same plant in New York State, but have never found a name for it. t is not one of Peck's species. Polystictus (unknown to me). It belongs to the group that includes our three species, perennis, focicola and cinnamomeus, but I hink is neither of these. It is strongly marked with long, decurrent pores down he stem. Spores elliptical 4x8 mic., hyaline, smooth, guttate.

John Hunter Nead, Michigan:—Lycoperdon piriforme, Stereum fasciatum.

Mrs. M. A. Noble, Connecticut:—Geaster triplex.

Lincoln W. Riddle, Massachusetts:—Polystictus perennis, Polystictus cinnamomeus, Fomes (cfr. conchatus), Clavaria Ligula (in beech forests. I was under the impression it only grew on pine needles), Polyporus picipes, Polyporus elegans, Fomes pinicola (on birch), Polystictus Drummondii (very rare. These are the first specimens I have seen excepting the types at Kew. Mr. Riddle found it on Abies. It is our only Polystictus, I think, of the section "Membranacei"), Polyporus aureo-nitans (= young radiatus, I think), Polyporus pocula, on quercus, Poria (sp.), Poria (? probably resupinate igniarius, I think), Polyporus adustus, Fomes connatus, Polystictus circinatus, Polystictus abietinus (irpecoid form, = irpex fusco-violaceus).

F. L. Sargent, New Hampshire:—Polystictus versicolor, Polyporus betulina, Polyporus squamosus, Lenzites saepiaria, Peziza aeruginosa, Polystictus abietinus, Fomes roseus, Fomes fomentarius, on Betula, Polyporus (sp.), Daedalea confragosa (Trametes form), Fomes leucophaeus, Polyporus (sp.), Daedalea unicolor, Polystictus cinnabarinus, Lenzites betulina, Polystictus perennis, Irpex lactea, Schizophyllum commune, Polyporus (sp.), Daedalea confragosa (lenzitoid form).

G. D. Smith, Ohio:—Polyporus cuticularis, Polyporus brumalis, Polyporus gilvus. Professor Smith is past master of the photographic art, and sends me a number of photographs of fungi, the finest I ever saw. When familiar with the plants I can recognize Professor Smith's photographs almost as readily as I could the fresh specimens. Polyporus cuticularis, Polyporus, three species, all unknown to me. Genus unknown to me. The plant is either immature or abnormal, as no hymenium is developed, but does not suggest any genus known to me.

E. B. Sterling, New Jersey:—Lenzites saepiaria, Polyporus adustus, resupinate, Lycogala Epidendrum, Schizophyllum commune, Polystictus versicolor, Polystictus pergamenus, Hypoxylon (sp.), Stereum spadiceum, Polystictus versicolor, Polystictus abietinus (not well developed), Polyporus resinosus, Pleurotus nidulans, Fomes leucophaeus, Trametes (sp.), Irpex (cfr. Tulipifera), Peziza (sp.), Fungus (???), Merulius tremellosus (??), Phallus Ravenelii (a very abundant collection, fresh. Mr. Sterling finds this species growing by the hundreds on an old sawdust pile), Phallus Ravenelii (a dense mass of matted mycelium with a great many eggs in all stages of development), Lycoperdon gemmatum.

E. B. Sterling, Wisconsin:—Lichen, Polystictus hirsutus (?). If so, a white form. Secotium acuminatum, Polystictus versicolor (typical), Polystictus (sp. ?), Pleurotus sapidus, Polystictus hirsutus, Polystictus (cfr. pubescens), Polyporus adustus, resupinate, Polystictus hirsutus, pale form, Polystictus zonatus (?). Genus unknown to me. It has the general appearance of being an orange Tremella, but consists entirely of a mass of long, curved, rod-shaped, hyaline spores 2½x16 mic.

William C. Stevenson, Pennsylvania:—Peziza aurantia.

Miss E. D. Storer, Pennsylvania:—Geaster pectinatus (rare in this country), Geaster minimus, Geaster hygrometricus.

Dr. Mary S. Whetstone, Minnesota:—Polystictus pergamenus, Merulius tremellosus, Polyporus gilvus, Polystictus conchifer, Sebacina merismatoides, Polyporus elegans, Cyathus striatus, on the ground (an unusual habitat) with a mycelial pad at the base, Polystictus versicolor, Stereum fasciatum, Hydnum erinaceum, Trametes hispida, thin form with large pores = Trametes stuppea, Polystictus cinnamomeus, Xylaria polymorpha, Xylaria digitata, Xylaria (sp.), Tremella reticulata. Same plant I received from Mr. Smith, Akron, Ohio, and which has acute branches like a Clavaria. I sent Mr. Smith's plant to Professor Farlow, and he advises me it is same plant as called "Corticium tremellinum var. reticulatum," by Berkeley. I can not understand how Berkeley could do such naming. Hydnum (sp.), Thelephora anthocephala, Polyporus adustus, Thelephora cuticularis, Thelephora vialis (?), smaller pilei than usual, Lentinus cochleatus, Lentinus vulpinus, Pterula multifida, Daedalea confragosa, Cantharellus infundibuliformis, Craterellus cornucopöides, Lycogala Epidendrum, Polyporus (sp. unknown to me), Polyporus (sp. unknown to me, cfr. albiceps), Helvella crispa, Polyporus frondosus, young (I think), Scleroderma Cepa, Boletus sphaerosporus. It is not generally known that we have a true boletus around Minneapolis with globose spores. The only one known in the world, I think. Polyporus radicatus (very ?), much too small, Sebacina (very ?), white, incrusting, with exactly the habits of Sebacina incrustans, but of a soft texture. A section shows a loose tissue of branching hyphae, but I find no hymenium. It is something curious.

CORRECTIONS.

In Letter No. 16 we reported a Tremella received from G. D. Smith, Ohio, as Tremella fusiformis, and commented on its resemblance to a Clavaria. We were not satisfied with the determination, however, and sent the plant to Professor Farlow. He kindly advises us that it corresponds to a specimen in the Curtis Herbarium, named by Berkeley "Corticium tremellinum var. reticulatum" (sic.). We are at a loss to understand how it was possible for Berkeley to so name it, as it has no relation to a Corticium, and is not reticulate. However, we would not wish to comment on it further until we see the plant so named in Berkeley's herbarium.

Some of the specimens sent by G. C. Fisher and reported in Letter No. 16 as from Ohio, were collected in Florida (the error being ours), viz.: Lycoperdon cruciatum and those that follow.

Some of the specimens listed in Letter No. 14 from Miss Rose H. Lane, California, were collected in the Philippines, as we have since been advised. We noted at the time that they were of a tropical type, previously unknown to the United States.

LETTER No. 19.

Cincinnati, Ohio, January 1, 1908.

List of specimens received from Europe and foreign countries since the last report, November 1, 1907, and including a few crowded out of Letter No. 17.

We list the plants here under the names as we have labeled them in the museum at the time they were received. Some of the species received from foreign countries, where the subject is little known, do not have names or impress us as being marked forms or varieties of known species. In these cases we think it is better to not specify the plants by definite names until we make a comparative study of the subject in connection with other forms known from these countries.

A number of plants received from tropical countries belong to families that we know very slightly as to their tropical species. The best we can do in these cases is to indicate the genus and compare them to their nearest allies in Europe and America. All such specimens are carefully preserved and will come into use in our future studies. At present we claim no critical knowledge as to tropical species, excepting as to the Gastromycetes.

I beg to thank my correspondents for the very liberal contributions they are making to the museum. All specimens received are carefully labeled and systematically preserved. My publications are sent to those who favor me with specimens, and I trust are a partial return for their trouble.

Owing to the uncertainty of American foreign mails I would prefer foreign species be sent to my Paris address as follows. They will reach me more surely, but with some delay.

C. G. LLOYD,
(Klincksieck) No. 3 rue Corneille (Odéon),
Paris, VI, France.

Continued From Letter No. 17.

PETCH, T., Ceylon:

Bovistella aspera (Nice specimens. These have a slight sterile base. I am now convinced that Berkeley's conspurcatum and citrinum, both surely the same, are old specimens after the cortex has fallen), Lycoperdopsis arcyrioides (A wonderfully good genus, recently described, Monsunia, page 158, from Java. These are the first specimens I have ever received excepting a small portion of the type kindly given me by Dr. Hennings), Nidularia unnamed ("Part of Berkeley's Ceylonese specimen of Nidularia Duriaeana." This has no resemblance to the Mauritius species; on the contrary, it is certainly an unnamed species. It is characterized by peculiar, branching, spiny fibrils of the peridiole walls, which are not known in any other true Nidularia, and only known in Nidula Emodensis of India, cfr. Nidulariaceae, pp. 9 and 12), Geaster saccatus (with an "elongated" mouth which I hardly think is natural), Sphaerobolus rubidus (From these dried specimens I could tell nothing, but Mr. Petch furnishes a most interesting

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AT LOS ANGELES

note on it: "The unopened fungi are white, but have blackened in drying. They grew on elephant dung, as did Berkeley's specimens. When fresh they are globose, white, slightly tomentose, about 1.25 mm. in diameter, opening with 4-6 small, almost upright teeth, which are reddish-yellow internally. The open fungus is somewhat urceolate. Peridiole oval, shining, red-brown, about 1 x .75 mm. Spores oblong, oval, 5-5.5 x 3 mic. It looks altogether different from Sphaerobolus stellatus as I have seen it abunddantly in England"), Lycoperdon rubeculum (I have obtained a much clearer idea of this species from Mr. Petch's specimens than from the type specimens at Kew. It is a good species with the thick, hyaline capillitium of Wrightii, the strong diaphragm of pratense, and the external appearance of piriforme. Its relations are closest with the pratense group. Spores small, 3 mic., apiculate, smooth, compressed globose).

PUJUILA, JAIME, Austria:

Fomes pinicola, Polystictus tomentosus-form (It seems to me, although this has two pilei superimposed, as in Fries' picture of Schweinitzii), Hydnum (sp. unknown to me).

RICK, REV. J., Brazil:

Tylostoma Berteroanum (Father Rick finds it in great abundance). Tylostoma verrucosum (or T. Bonianum if these species are really distinct from each other, which I am now inclined to doubt).

SCHUPP, REV. F. A., Brazil:

Hirneola auricula-Judae, Xylaria (sp.), Itajahya galericulata, Polystictus, Fomes, Clathrus (a nice dried specimen and photograph of a species that I do not know. It surely is not in Moeller's Phalloids of Brazil. There are several species such as Clathrus crispatus of Ceylon and Clathrus pseudo-cancellatus of Africa that are not illustrated, or with such figures that no idea can be obtained of them, and we can not know what their real characters are), Simblum sphaerocephalum.

TEPPER, J. G. O., South Australia:

Mesophellia sabulosa (This curious Australian genus was fully considered in our Australian pamphlet. It is among the most curious puff balls we have, and the genus is known from no other country in the world. This is the first specimen I have received, and the specimens in Europe are principally at Kew. Mesophellia sabulosa is very close to the original species Mesophellia arenaria. They have the same spores, which are 5-6 x 12, rather than 4 x 12, as stated in our pamphlet. The only difference is the exoperidium. In arenaria this peridium is of coarse fibrous tissue: in sabulosa it is of the nature of a sand-case), Cyathus Colensoi (which is only an Australian form of Cyathus vernicosus, with more globose spores. Very close and otherwise exactly the same).

THOMSON, GEO. M., New Zealand:

Scleroderma flavidum.

YASUDA, A., Japan:

Fomes fomentarius (Not as "ungulate" as this species is in America and Europe, but surely the same species), Fomes leucophaeus (Our common species in the United States), Polyporus volvatus (Exactly the same as our American plant. The occurrence of this unique species *in*

Japan ought to open the eyes of those botanists who treat fungi as though they were local in distribution), Polystictus versicolor, Geaster hygrometricus—unopened, Cyathus stercoreus (surely the only common Cyathus in Japan). Also six other polyporoids unknown to me.

Received Since Letter No. 17.

ACLOQUE, A., France:

Geaster Schmidelii.

BADET, REV. L., Italy:

Cyathus vernicosus, Fistulina hepatica, Polystictus cinnamomeus, Lycoperdon (young).

BARBIER, M., France:

Trametes gibbosa, an obese, abnormal form, Fomes pinicola, Polyporus caesius, Polyporus (species), Polyporus fumosus (on willow).

BERNARD, DR. CHAS., Java:

A fine lot of phalloids in alcohol, representing almost the entire phalloid flora of Java. We are enabled to make photographs of several species not heretofore represented in our collection. Detailed accounts will be given in Mycological Notes. The collection embraces the following species: Phallus indusiatus, Jansia rugosa, Aseroe arachnoidea, Simblum gracile, Mutinus bambusinus, Clathrus Treubii, Phallus irpicinus, and the following Nidulariaceae, Cyathus Poeppigii, spores 24 x 32. Cups are smaller and lighter color than usual. Cyathus (sp.), material scanty, and I find no spores. Also two specimens in alcohol belonging to genera, I know nothing about as to their foreign species. Xylaria (sp. ?), Lachnocladium.

BOURDOT, REV. H., France:

I receive a great many specimens from correspondents, but I have never gotten a nicer shipment than the box I received from Rev. Bourdot. They were all labeled (evidently in keeping with the views of Rev. Bresadola, which greatly enhances their value to me). I list them as labeled, excepting in a few instances, and where Quèlet's "generic" names were used. These specimens from Rev. Bourdot were all ample in quantity, excellent in quality, and as a whole the nicest shipment I have received this season. Poria taxicola, Poria vaporaria, Poria terrestris, Poria reticulata, Poria obducens, Porio contigua, Poria ferruginosa, Poria gilvescens, "Bres, in litt," Fomes nigricans (This determination accords with Boudier's recent plate and differs from the interpretation of Bresadola, Fungi Knet.), Fomes Euonymi, seems to me distinct from ribis. Fomes jasmini (Rev. Bourdot attributes this to Quèlet, but I am unable to find where published. It is a new plant to me, somewhat resembling Fomes scutellatus in size and general appearance, but its relations are in a different section of the genus), Fomes rubriporus, Polyporus pubescens (We have a plant in the United States that passes for "Polyporus pubescens, Fr." but it seems to me not the same as the European plant.) Polyporus betulinus, Polyporus elegans, Polyporus stipticus, Polyporus dichrous (A rather rare plant in Europe, and these are the first *fresh* European specimens I have seen. The *old* specimens in the museums of Europe have changed so that I could tell very little about them. A *very common* plant in the United States, and surely the same as the European.) Polyporus caesius, Polyporus radiatus, Polyporus rufescens (or Daedalea rufescens, as labeled), Polyporus Marianii (Det. Bresadola!), Trametes pini, Trametes gibbosa, Trametes rubescens, Lenzites tricolor, Septobasidium Bagliettoanum, Hymenochaete corrugata.

BRANDIS, E., Bosnia:

Trametes gibbosa (on Abies), Polyporus adustus, on Abies. Some have the typical "smoky" hymenium, but others the hymenium was so light color I would have had trouble in placing them had they been sent separately. Polyporus varius, on Abies. Lycoperdon piriforme, Panus rudis, on Abies. Exactly the same plant we have in the United States and which for so many years was known here as "Lentinus Lecomtei." Our plant, however, is usually on frondose wood. Fomes fomentarius? (Not characteristic, if correct. I find no spores.) Lenzites sepiaria.

CEPÉDE, C., France:

Lycoperdon spadiceum, Daldinea concentrica.

DRAPER, WALTER, Egypt:

Poria (sp. unknown to me).

DUNCAN, S., New Zealand:

Polystictus (sp.) Most curious with a black hymenium, *minute pores*, colored setae. I can get no trace of it in the books, but may be able to "match it" in some museum of Europe. Undescribed genus close to Protubera, Calvatia lilacina (sterile base), Stereum (sp.), Geaster saccatus, Stereum (sp.), Lycoperdon pratense, Clathrus cibarius, Daedalea (cfr. quercina), Auricularia (sp.), Tremellodendron (?) sp., Secotium erythrocephalum. A unique and beautiful species that reaches me only from New Zealand. The spores vary much in size. These are from 6-9 x 12-18 mic. Scleroderma Cepa? Fomes (sp.), Corticium (sp.).

DUPAIN, VICTOR, France:

Lenzites flaccida, Polyporus rutilans, Poria (sp.), Trametes (sp.), Fomes Ingelzae, Fomes applanatus, Polyporus sulphureus, Polyporus lucidus, Polystictus (sp.), Polyporus hispidus, Polystictus velutinus, Fistulina hepatica, Polyporus elegans, Polyporus varius, Daedalea quercina, Polystictus lutescens? I should judge from the books, but I do not know. Poria (sp.).

ENGELKE, C., Germany:

Fomes igniarius? Polystictus perennis, Polystictus versicolor, Polyporus varius, Scleroderma verrucosum, Polyporus benzoinus, Fomes salicinus, Poria purpureus (as labeled).

FAURIE, REV. U., Japan:

Three collections and forms of Lycoperdon gemmatum, which is a very common species in Japan, as it is in the remainder of the temperate world. Lycoperdon polymorphum, the true type form of Europe with a well developed sterile base, and which does not occur (typically) in the United States.

GREEN, ALBERT, New South Wales:

Stereum hirsutum, Polyporus, Catastoma abnormalis, Cyathus stercoreus, Boletus, Stereum (Hym.) cfr. rubiginosum, Poria (probably) resupinate Fomes, cfr. salicinus. Panus (cfr. rudis). It answers the description of Lentinus dealbata in Cooke's Handbook. Irpex (cfr. pachylon), Schizophyllum commune, Polystictus sanguineus, Trametes lactinea (?), Hexagona tenuis, Hexagona (sp.), Sent with the preceding, but certainly a distinct species.

HAMILTON, A. G., New South Wales:

Geoglossum nigritum, Scleroderma flavidum, blacker than usual, but too small for S. Geaster. Peziza, Lycoperdon pusillum, Geaster Readeri.

ICHIMURA, T., Japan:

Scleroderma tenerum.

JAAP, PROFESSOR OTTO, Germany:

A fine collection of interesting species. They were all labeled by Professor Jaap, and most of them are listed as labeled. In fact, a number of the Porias I would have been unable to name.

Lycoperdon umbrinum, Poria eupora, same plant as called in the United States Poria attenuata. Eupora is "prior." Poria taxicola, Poria sanguinolenta "frisch rein weiss, bei Druck rot, dann braun werdend." Lenzites trabea, Polyporus fragilis, Polyporus radiatus, Fomes conchatus, Polyporus acanthoides (??), Polyporus giganteus, Polyporus elegans, Polyporus albidus, Polyporus fibula, Polyporus fragilis, Polyporus caesius, Poria nodulosa, as labeled at least, Poria mucida, Poria reticulata, Poria purpurea, Poria subtilis.

Polyporus radiatus, Polyporus nodulosus. Prof. Jaap gives as a synonym P. polymorphum, and on studying Rostkovius' figure I think he must be right. But the plant is a Polyporus, not a Polystictus, as usually classed. Poria medullapanis, Poria taxicola, Polystictus versicolor, Poria obliquus, Poria floccosa (?), Calvatia saccata, Lycoperdon cupricum?

KLINCKSIECK, PAUL, France:

Trametes Bulliardi (as labeled). Another marked form of the polymorphic "Daedalea confragosa." This specimen has a surface not "laevi, glabro," as called for in the description, but rather "molli villoso" like Trametes gibbosa. Of the many forms of this plant I have seen this is the first one with such a surface. Trametes hispida, Stereum purpureum (?).

KRUGER, PROFESSOR W., Germany:

Polyporus adustus, Polyporus crispus. This answers Fries' description exactly, and I think is the true crispus. It differs from adustus in its *large, lacerate* pores. Polyporus fumosus, Polyporus fumosus, resupinate, Lenzites betulina, Lenzites flaccida. The distinction between Lenzites betulina and Lenzites flaccida is beginning to be plain to me, but I think they run together, so that it is not practicable to keep them distinct. Fomes igniarius, Polystictus versicolor, Daedalea unicolor, Polystictus zonatus? Trametes (unknown to me).

KRUMBIEGEL, G. H., India:

Six collections of polyporoids. All, save one, belonging to the section Ganoderma. I have never worked with the foreign species of these plants.

Geaster Englerianus. These are the typical black forms that occur only in the tropics.—Phalloid (unnamed). It was a dried specimen only, unaccompanied by notes or sketch. I would not like to try to reconstruct the plant from the specimen, but am confident it is no known species I hope to get further details.

LAING, H. W., New Zealand:

Secotium lutescens. Color of the peridium "dark cream to pale yellow on upper surface, lighter color below." Spores colored, smooth, elliptical 7 x 12 mic. The plant is closely related to Secotium erythrocephalum, but differs in color, which is "pale yellow" instead of bright scarlet. The plants are not well dried, but it seems to me the peridium takes more of a pileate form than usual in this genus and spreads out away from the stipe. It is very distinct from all species previously known to me.—Pilacre. "A small red plant, growing on a piece of clay." It belongs, I think, to the genus Pilacre, a genus little known to me. I find no description of any red species.—Crucibulum vulgare. A small form that is more frequent in Australia than in Europe or America.—Secotium scabrosum. This is the first collection I have received of this plant, and all previously known was a single head at Kew. It differs from its allies in having *warted spores*. Color "bright violet" when fresh.—Secotium (unnamed). Color "malachite green on the upper surface, lighter yellow." No green Secotium is described. It differs from other species also in having *strong apiculate* spores, almost pedicellate.—Scleroderma flavida—Clathrus cibarius. Mr. Laing writes that the species is "plentiful enough in some localities. Usually they are three or four inches in diameter, as stated by you, but in some cases they grow even up to six inches in diameter."—Geaster limbatus. Typical as to form with the English plant and the first collection recorded from Australasia. There is only one difference between this collection and the European plant. The color of the English endoperidium is black, of the New Zealand more grayish, even silvery. A "new species" might be based on the difference, but I do not think it advisable to thus needlessly complicate matters.—Lycoperdon pratense, with abnormal cortex.

LUJA, EDOUARD, Congo Free State:

Cyathus. It does not exactly fit anything. Spores 16 x 18. Coarse peridiole fibrils. Closest to limbatus and Montagnei.—Lycogala Epidendrum. The occurrence in Central Africa of this little Myxomycetes, so common in Europe and United States, is another evidence of the wide distribution of fungi.—"Xylaria flabelliformis" or very close. Almost the same plant that we have and which Schweinitz first called Thelephora (Merisma) nigripes and afterwards Xylaria flabelliformis, claiming that it was the conidial state of a Xylaria, which view was accepted in Ellis' Pyrenomycetes, and is current tradition in America. It has, however, I think, never been verified by observation. The African plant is very much the same shape, but has larger spores, 4 x 8 (3 x 6 in American form). Calvatia lilacina, as it *grows in every country in the world*.

MUNN, MRS., Jamaica:

Calvatia lilacina (sterile base).

PETCH, T., Ceylon:

Lycoperdon cervinum. In the sense of Berkeley's Ceylon determination, not of his South American, which is not a Lycoperdon.—Lycoperdon rubeculum, a good species as previously noted.—Geaster Archeri (form).

Mr. Petch notes, "Geaster saccatus *with a sulcate mouth*, from the same square yard as my former specimens." It is undoubtedly true that Geaster Archeri is Geaster saccatus *with a sulcate mouth.* But "sulcate" and "even" mouths are held as the primary division of the Geasters, and if we disregard it we shall have no character whatever on which to base species (Cfr. Article on page 7 of Index to Vol. I, also Notes on the Geasters, page 142). Mr. Petch's specimens also present a new character in Geaster Archeri. The endoperidium is scurfy, "asperate;" indeed, if it has a pedicel it would be Geaster asper.

ROLLAND, L., France:

Polyporus dryadeus—Polystictus zonatus.

SCHINZ, PROFESSOR HANS, Switzerland:

Cyathus striatus—Lycoperdon Desmazieres.

SILLITOE, F. S., Khartoum, Soudan:

Podaxon Mossamedensis. The species of Podaxon are all more or less doubtful, for it is difficult to decide as to the specific value from the scanty collections in the museums. They differ in size and shape of spores and color of gleba, but it is a question if color is not a condition of ripeness instead of a character. Mr. Sillitoe's plant has globose, acajou colored spores 8-10 mic. in diameter, and agrees only with Mossamedensis, which was from Angola, Africa, and the type in the British Museum. It has same spores as pistillaris, but is a larger plant.—Fomes (Ganoderma).

STEPHENS, ELLEN, Jamaica:

Cyathus Montagnei.

TORREND, REV. CAMILLE, Ireland:

Poria vulgaris, Poria eupora, Poria sanguinolenta, Poria farinella, Poria (unknown to me). It has the texture and appearance of Merulius tremellosus, but I think a Poria not a Merulius.—Polyporus elegans (?)—Poria (sp.). It has peculiar colored setae tipped with a hyaline gland.—Polyporus elegans—Fomes annosus—Poria (2 species)—Lycoperdon piriforme (form)—Lycoperdon piriforme var. tessellatum—Lycoperdon velatum (without the veil)—Lycoperdon velatum—Lycoperdon piriforme (form)—Cyathus striatus.

TORREND, REV. C., Portugal:

Colus hirudinosus. Rev. Torrend finds this frequent in the sand and *not* on manure, which was the habitat of the original specimens from Corsica. He also finds specimens without stipe, tending to invalidate the genus Colus by uniting it to Clathrus. He sends nice specimens in alcohol, from which I shall be able to make good photographs. The plant has never been illustrated by a photograph.—Geaster Schmidelii—Geaster elegans (rare, cfr. Myc. Notes, p. 312)—Geaster minimus—Torrendia pulchella. Fine specimens in alcohol of this unique genus. I will shortly have an article in Mycological Notes, as I can now illustrate it satisfactorily from these specimens. No other related genus is known in the Gastromycetes. Bovista radicata, a rare plant in Europe, cfr. Myc. Notes, pp. 262 and 280. Lycoperdon piriforme, this specimen collected in Ireland. Tylostoma granulosum—Lycoperdon pusillum—Lycoperdon pratense—Lycoperdon polymorphum (form). This differs from the type form in having slightly elliptical spores. Lycoperdon pusillum—Calvatia lilacina—Gyrophragmium lusitanicum as named by Father Torrend. It is a form with a subterranean stem, the pileus resting on the surface of the sand. Spores are subglobose 5 x 6 mic., smooth, about the same as in the type form.

TURNER, E. J., Australia:

Thelephora (?). It has the appearance of a Thelephora, but the spores do not fit. They are globose, subhyaline, smooth, 4 mic. Geaster saccatus (?). Specimen old and doubtful.

USSHER, CHAS. B., Africa:

Geaster Javanicus, fine specimen of a beautiful tropical species. Lycoperdon fuligineum, form. Agrees with the type form in habits and dark peridium, scanty sterile base, and particularly in thick, hyaline, septate capillitium. It *differs* in spores, which *slightly* rough, are not as in the type form "strongly spinulose." Geaster saccatus, small tropical form with dark, inner peridium. Xylaria (Sp.), conidial form. Cyathus limbatus, spores 16 x 20-24. It looks more like Poeppigii as to cups, but we must refer it to limbatus on its spores. It is really intermediate.

VAN BAMBEKE, DR. CHARLES, Belgium:

Fomes connatus—Polyporus giganteus—Fomes cryptarum (as labeled). I am not familiar with it, but it seems to answer Fries' description and fairly well Bulliard's figure. Bresadola refers cryptarum to Fomes annosus, which these specimens are certainly not.—Polyporus (?)

OBSERVE YOUR PHALLOIDS.

The phalloids of the world excepting Europe, Java, Brazil, and the United States are practically unknown. They grow with you and are such striking plants that they should excite your curiosity. They are all foetid. We want to learn them; we want to learn what grows with you, and it will be an easy matter if you will aid us. When you find a phalloid, make a sketch of it (a crude one will answer), and indicate on the sketch the colors of the parts. Then dry the specimen and send the sketch and dried specimen. Write us if it is common or rare, where it grows, any local names it may have, etc. If you indulge in photography, a good photograph is the best record you can make of the plant, and should it prove to be a species not illustrated by a photograph, we will gladly publish your photograph with due credit.

Will you not aid us with dried specimens, sketches, or photographs if possible, of your phalloids? C. G. LLOYD,

(Klincksieck) No. 3 rue Corneille (Odéon),
Paris VI, France.

Letter No. 20.

List of specimens received at Cincinnati from American correspondents, from January 1, 1908, to the date of my departure for Europe, the latter part of June, 1908.

The names are according to the usual nomenclature of the specimens in American mycology, but, as often emphasized in previous letters, I claim no critical knowledge of the subject except as to the Gastromycetes.

Professor G. F. Atkinson, New York:—Protocoronospora nigricans (co-type).

E. Bartholomew, Illinois:—Fomes reniformis.

E. Bartholomew, Kansas:—Polyporus alboluteus (beautiful specimens collected by E. Bethel, Colorado)—Pleurotus nidulans—Lycoperdon pulcherrimum. A mammoth form, three inches broad, and turbinate shape. Had it been sent separately I should have thought it something new, but small specimens of the same collection can not be told from the usual form in our Eastern States.

E. Bethel, Colorado:—Dictyocephalus curvatus (although not a perfect specimen we are glad to get it for our museum, as it is a part of the only good collection known. Mr. Bethel is the only one who has ever collected this plant, and he has found it in good condition but once, cfr. Myc. Notes, pp. 136 and 411)—Polysaccum crassipes—Phallus imperialis.

M. Bubna, Ohio:—Fomes leucophaeus—Polyporus arcularius (small specimens)—Polystictus cinnabarinus—Polystictus pergamenus—Polystictus hirsutus (old)—Polyporus elegans—Merulius tremellosus—Polystictus hirsutus—Polystictus conchifer—Polystictus pergamenus—Polyporus (sp.)—Polyporus Spraguei—Polyporus adustus—Merulius incarnatus—Polystictus versicolor—Daedalea confragosa—Clavaria pistillaris, the form called (incorrectly) Craterellus clavatus by one American author—Lenzites saepiaria—Polystictus versicolor—Fomes fomentarius—Hypoxylon (sp.)—Polyporus gilvus (unusually yellow form)—Stereum fasciatum—Polyporus adustus—Daedalea confragosa—Polyporus gilvus—Polystictus pubescens (as known in American mycology, but I think?)—Polyporus sessile—Polyporus distortus—Polystictus hirsutus—Lenzites betulina—Polyporus benzoianus—Polyporus lucidus—Lenzites corrugata—Daedalea confragosa—Lenzites saepiaria—Xylaria polymorpha—Polyporus (sp.).

Dr. J. F. Brenckle, North Dakota:—Secotium acuminatum—Geaster floriformis, some with indefinite and some with definite mouths. Thus our distinction between Geaster floriformis and Geaster mammosus fades away—Geaster asper—Catastoma nigrescens, an undescribed species which I have had previously from Professor Shear and Ernest Knaebel, both collections from Colorado—Bovista plumbea, large, robust form—Cyathus Schweinitzii, growing on soil—Bovista (cfr. dealbata). The color is very dark, the size smaller, and it has no adnate cortex which we associate with dealbata. It is very close, however.

Dr. J. F. Brenckle, Wisconsin:—Panus stipticus—Fomes leucophaeus—Daedalea unicolor, the thick form called Daedalea cinerea—Polyporus resinosus—Hydnum ochraceum—Polystictus versicolor—Fomes Ohiensis—Polystictus biformis—Polystictus pubescens.

Dr. J. E. Crewe, Minnesota:—Cyathus Schweinitzii—Lycoperdon Wrightii—Crucibulum vulgare—Lycoperdon piriforme—Geaster saccatus—Schizophyllum commune—Polyporus gilvus—Trametes hispida—Fomes leucophaeus—Polystictus hirsutus—Stereum rufum—Poria tulipfera—Favolus europaeus—Irpex cinnamomeus—Polystictus (sp.)—Panus rudis—Trametes obtusus.

Professor B. M. Duggar, Missouri:—Secotium acuminatum—Bovistella Ohiensis—Mycenastrum Corium—Calvatia rubroflava—Calvatia gigantea. All fine specimens, and correctly labeled by Professor Duggar. When correspondents begin sending in puff balls correctly determined I feel encouraged concerning the puff ball situation.

Rev. H. Dupret, Canada:—Favolus europaeus—Hydnum Schiedermayeri (?)—Panus rudis—Polystictus perennis—Polystictus versicolor—Lenzites sepiaria (Trametes form)—Lenzites sepiaria (resupinate, abnormal form).

S. C. Edwards, New York:—Thelephora coryophylla—Xylaria corniformis—Phlebia radiata—Poria (sp.)—Hydnum adustum—Polyporus dichrous—Polyporus gilvus, on cedar, an unusual habitat.

H. S. Fawcett, Florida:—Fomes marmoratus (?), a thin, applanate form? Spores globose, 5 mic. h. s.—Ganoderma, sp. unknown to me—Peziza (sp.)—Panus rudis—Trametes hydnoides—Lentinus Berterii—Polystictus pergamenus—Stereum subpileatum—Polystictus hirsutus—Sclerotia of Hypochnus ochroleucus, teste Professor Burt, as published by F. L. Stevens—Polystictus hirsutus, southern fulvous form—Polyporus gilvus—Stereum versicolor—Polystictus abientinus—Fomes marmoratus—Mycenastrum Corium. The first station for this plant from our Southern States.

Professor Bruce Fink, Ohio:—A set of the lichens of Iowa, 122 species, determined and named by Professor Fink. We are glad to get this set in the Lloyd museum for the benefit of future students of the lichens.

G. C. Fisher, Florida:—Cordyceps ophioglossoides—Leotia lubrica—Trametes perpusilla, large and more perennial than the forms around Cincinnati—Polyporus hispidus, on oak. Rare in the United States, frequent in Europe—Polystictus dependens, a rare find. The third collection known and the first I have received (cfr. Pol. Issue No. 1)—Polystictus ectypus (?)—Polyporus Schweinitzii—Hypomycetes (sp.)—Polystictus hirsutulus—Schizophyllum commune—Polystictus hirsutus—Poria viticola (?)—Polystictus dependens, on tulip tree!! The tradition has always been that it grew on pine—"Trametes serpens" as known in American mycology, but I think not—Stereum albobadium—Polyporus Schweinitzii—Polyporus gilvus (form)—Trametes abietis (?) (cfr.)—Poria coruscans (I judge from description)—Polystictus hirsutus (white pored)—Lenzites flaccida—Peziza—Polystictus hirsutus (?)—Merulius Corium, pale form—Fomes (cfr. marmoratus)—Polystictus versicolor—Septobasidium retiformis—Hymenochaete purpurea—Polystictus hirsutulus (?)—Hymenochaete (sp.)—Irpex pachylon—Rhizopogon (rubescens?)—Tubercularia vulgaris—Geaster minimus—Polystictus sanguineus—Polyporus arcularius—Stereum versicolor—Polyporus hispidus (rare in the United States and usually reaches me from Florida)—Polyporus Curtisii—Bovistella (unnamed). A very distinct species, and the only one except the unique B. trachyspora of British India that has markedly rough spores—Polyporus arcularius (depauperate)—Hydnum pulcherrimum (young?)—Polyporus gilvus—Calvatia lilacina—Bovistella Ohiensis (beautiful specimens).

Miss Mary Fitzgerald, North Carolina:—Stereum Curtisii (?)—Polystictus, unknown to me, but related to versicolor, but I think quite distinct—Polyporus oicipes—Polystictus hirsutus—Fomes annosus—Isaria farinosa—Cordyceps militaris —Coniophora (?)—Thelephora albido-brunnea—Stereum frustulosum—Stereum spadiceum (?)—Stereum complicatum—Ozonium auricomum—Polyporus gilvus—Polystictus hirsutus—Poria (3 species)—Xylaria polymorpha (very ?), young—Genus. A most curious genus, which was sent by Miss Fitzgerald before. It is ınknown to me.

Professor H. Garman, Kentucky:—Mitremyces Ravenelii. (A rare station for ı Mitremyces.)

C. C. Hanmer, Connecticut:—Trametes suaveolens—Xylaria digitata—Xylaria ·astorea (Det. Peck).

H. S. Jackson, Delaware:—Lycoperdon atropurpureum (young)—Lycoperdon oiriforme—Lycoperdon umbrinum—Lycoperdon Wrightii—Lycoperdon polytrichum —Lycoperdon (sp.)—Calvatia lilacina—Scleroderma Geaster—Cyathus Schweinitzii —Cyathus stercoreus.

Chas. W. Jenks, Massachusetts:—Polystictus versicolor—Trogia crispa—Irpex actea—Polystictus hirsutus—Stereum (cfr. rubiginosum).

Rose H. Lane, California:—Bovista plumbea.

W. H. Long, Texas:—Daedalea ambigua—Urnula Geaster, the first specimen ever received—Lysurus (red form). In my opinion only a red form of Lysurus ardneri—Tylostoma poculum—Elaphyomyces (sp.)—Tylostoma albicans—Polyorus (cfr. gilvus)—Trametes hydnoides—Lycoperdon cepaeforme—Geaster floriormis—Calvatia occidentalis—Geaster arenarius—New genus. Very close to rachnion album, but spores not in peridioles and capillitium septate, nodular. It ıay, however, only be a modification of Arachnion—Lycoperdon pusillum—atastoma circumscissum—Simblum sphaerocephalum—Calvatia lilacina—Arachion album—Catastoma subterraneum, with small spores of circumscissum—atastoma pila—Geaster (cfr. minimus)—Lycoperdon cruciatum—Trichaster (?). omething abnormal, I think. It has a sterile base!—Lycoperdon Wrightii—rachnion rufescens. A color form of Arachnion album with reddish peridium—alvatia occidentalis—Tylostoma (sp.).

Everest J. Macy, Florida:—Geaster striatulus (a very rare species)—Tylostoma lbicans—Geaster minimus.

Professor T. H. McBride, Iowa:—Stereum spadiceum—Fomes leucophaeus—omes reniformis (seems harder than usual, and possibly it is perennial, in which ıse it is Fomes applanatus of Europe)—Poria spissa, in sense of Morgan, not of chweinitz—Poria niger (?)—Battarrea phalloidea.

Geo. E. Morris, Massachusetts:—Bulgaria inquinans—Bulgaria rufa—Geaster oronatus (rare form with us)—Leotia chlorocephala—Polystictus conchifer—olyporus albellus—Merulius tremellosus—Peziza macropus—Guepinia spathularia -Exidia (sp.). (Called incorrectly truncata in American mycology.)—Polystictus ersicolor—Panus strigosus (very ?). This is at the best pubescent, not strigose I have seen specimens in Professor Peck's collection—Fomes pinicola, form!! ith strong, sulcate crust and short annual layers. I do not know that this form ıs a separate designation, but it should have.

J. Hunter Nead, Michigan:—Xylaria polymorphum.

New York Botanical Garden (from various localities). Except when stated s labeled" we list these species under the generally accepted names.

Daedalea unicolor, confragosa, quercina, elegans.

Polystictus pinsitus, perennis, hirsutus, sanguineus, biformis, micromegas versicolor, membranaceus, circinatus, occidentalis, versatilis, cinnamomeus (?) ectypus, licnoides, pergamenus, iodinus, cinnabarinus, trichomallus, gibberulosu (as labeled), arenicolor (as labeled), crocatus (as labeled), conchifer, abietinus mutabilis, barbatulus, hirsutus (? form).

Polyporus pocula, picipes, resinosus, Tricholoma, volvatus, lucidus, hispidus adustus, Berkeleyi, Schweinitzii, frondosus, brumalis, sulphureus, elegans, arcu larius, rutilans, betulinus, gilvus.

Trametes hispida, pini, perpusillus, hydnoides, obtusus.

Lenzites betulina, saepiaria, striata.

Fomes marmoratus, fraxinophilus, connatus, leucophaeus, pinicola, annosus fomentarius, australis, Everhartii, rimosus, conchatus, roseus, scuttellatus, nigr cans, Auberianus (as labeled).

Poria tulipfera.

Hexagona tenuis.

Irpex mollis (as labeled).

Specimens received from Mrs. M. A. Noble, P. H. Rolfs, Professor W. A Setchell, Professor G. D. Smith, F. L. Stevens, M. L. Sutliff, Mrs. Susan Tucker H. H. Whetzel, and Charlotte M. Wilder will be acknowledged in detail in th next letter.

C. G. LLOYD.

Cincinnati, Ohio, June, 1908.

LETTER No. 21.

List of specimens received at Cincinnati, Ohio, from foreign correspondents, from January 1st, 1908, to the date of my departure for Europe, June 28, 1908.

On my arrival I found a number of packages that will be acknowledged in detail in my next letter. At the time this letter is printed (August, 1908), I am located on the historic collecting grounds of the illustrious Elias Fries, at Upsala, Sweden. I expect to remain here during the collecting season, but will return to Paris at the close of the season and hope to find there a number of packages.

I trust my European correspondents who receive my letters and pamphlets will not forget me when they note specimens of all kinds of polyporoids. I am studying especially those plants of **Europe** and **America**, and shall be glad to receive specimens, particularly of the **rarer polyporoids.** As I shall not return to Paris until late in the season, there may be some delay in acknowledging the specimens, but they will be no less appreciated when received.

C. G. LLOYD,
(Klincksieck) No. 3 rue Corneille,
Paris, France.

ARANZADI, T. DE, Spain:

Polyporus adustus—Phallus impudicus—Lenzites betulina—Lycoperdon umbrinum—Stereum hirsutum—Trametes hispida—Polyporus rufescens—Geaster hygrometricus—Lycoperdon (sp. unknown to me)—Cyathus vernicosus (the form called Anglicus, which I supposed only grew in England)—Tuber brumale—Polyporus giganteus—Calvatia caelata—Lycoperdon atropurpureum—Stereum (Peniphora), species unknown to me.

BARBIER, M., France:

Trametes odora—Polyporus fumosus—Polyporus adustus—Lenzites saepiaria—Merulius molluscus—Daedalea quercina—Poria (sp.)—Stereum ferrugineum—Lenzites flaccida—Trametes gibbosa (thin form).

BEZZI, M., Italy:

Polyporus lucidus—Lenzites betulina (form flaccida)—Polystictus velutinus?—Polyporus on apple, undeveloped, but unknown to me.

CAVARA, F., Italy:

Polysaccum pisocarpium.

CRADWICK, WM., Jamaica:

Daldinea concentrica, very large specimens.

CROSSLAND, CHAS., England:

Fomes ulmarius—Trametes gibbosa—Polyporus adustus—Polyporus rufescens—Poria vaporaria—Polystictus versicolor—Polyporus Schweinitzii—

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Fomes applanatus—Polystictus abietinus—Polyporus trabeus (?)—Poria resupinata (as labeled)—Polyporus adiposus, first specimens I have gotten—Polyporus betulinus—Polyporus amorphus (?)—Poria subspadicea (?)—Polyporus giganteum—Fomes australis (very ?)—Fomes annosus—Polyporus radicatus—Polyporus adustus, unusually black hymenium—Poria mollusca (as labeled). Also the following Boleti, all listed as labeled by Mr. Crossland: Boletus fulvidus (?), badius, laricinus, parasiticus, flavus, porphyrosporus, piperatus, chrysenteron, subtomentosus, duriusculus, edulis (sp.), and Lycoperdon gemmatum. (The form known in England (in error) as L. perlatum).

DUMÉE, P., France:

Polyporus amorphus (?)—Polyporus brumale—Polyporus adustus—Daedalea unicolor—Daedalea confragosa, very odd and unusual trametoid form—Fomes applanatus—Fomes pomaceus—Fomes Euonymus—Polyporus lucidus.

EVANS, F., Trinidad:

Cyathus Berkeleyanus, a fine collection. The spores are 8 mic. and perfectly globose. Same plant that I received from H. Millen, Tobago—Schizophyllum commune—Xylaria (sp.?) on seed—Also four fleshy agarics, in my opinion indeterminable from dried specimens.

EYRE, WM. L. W., England;

Polyporus Schweinitzii—Fomes applanatus—Polyporus spongia, as labeled. I am much interested in "spongia," as it is one of the species I do not know.

GIBBS, THOS., England:

Polyporus adustus—Lycoperdon velatum—Fomes annosus—Fomes annosus (old, resupinate)—Polyporus fumosus—Poria ferruginosa?—Poria vaporaria?—Polystictus versicolor.

GILLOT, DR. X., France:

Daedalea biennis—Daedalea unicolor—Polystictus versicolor—Polyporus lucidus—Polyporus brumalis—Polystictus velutinus (as labeled). The latter a species concerning which I have never gotten any certain conclusions. These specimens well merit the name "velutinus," for they have a surface like velvet, but Fries says "albo demum lutescente," and it does not seem possible to me these were ever white.

HAGLUND, ERIK, Sweden:

Polyporus Schweinitzii—Poria (sp.)—Polyporus amorphus—Polyporus melanopus—Polyporus (sp.)—Polyporus elegans—Polyporus benzoinus—Poria taxicola—Poria purpurea (as labeled). It seems to me to be resupinate abietinus.—Polyporus elegans—Poria reticulata—Daedalea unicolor—Poria vulgaris (as labeled).

HAWLEY, H. C., England:

Fomes applanatus, a thick, not applanate form—Fomes pectinatus?—Polyporus varius (This is an infundibuliform, typical picipes in the sense of Berkeley.)—Polyporus (sp.)—Poria ferruginosa (?)—Polyporus rutilans—Polyporus spumeus (?)—Poria, white—Polyporus radiatus—Polyporus fragilis—Poria.

HERTER, W., Uruguay:

Cyathus stercoreus—Calvatia lilacina—Tylostoma Berteroanum—Scleroderma (sp.)

HILL, A. J., British Columbia:

Polystictus versicolor.

KUSANO, PROFESSOR S., Japan:

Calvatia Gardneri (originally from Ceylon)—Lasiosphaera Fenzlii. This is the "giant puff ball" of Japan, very distinct, but confused in Japanese literature with Calvatia gigantea (or "Globaria bovista," as called in Matsumura's Index). Professor Kusano also kindly sends me colored drawings of five Japanese phalloids, all so well done that I think I can recognize all the species. An article will be devoted to them in Mycological Notes.—Phalloids in alcohol—Phallus tenuis, rare in Japan—Mutinus boninensis, I judge from the illustration, the common Mutinus of Japan, and probably the only one—Lysurus Mokusin. The arms are connivent and there is no evidence that they open, but I think they do in time.—Laternea bicolumnata, as I shall call it if Professor Kusano does not wish to publish it. It has only two columns, and while, of course, we can not say that it is a specific character from a single specimen, it probably will prove characteristic of the Japanese plant, and in that case it is entitled to a name. It is the first time the genus Laternea has been noted from Japan.

LIND, J., Denmark:

Polyporus Weinmanni, as labeled, but not the same plant I have gotten from Germany under this name. I think *this* is the correct one—Lenzites betulina—Polyporus fumosus—Fomes applanatus.

LUJA, EDOUARD, Congo Free State:

Calvatia longicaudum (This species was named by Dr. Hennings from sterile bases, as Lycoperdon longicaudum. Mr. Luja's specimens are perfect, with the globose, fertile heads, and are typically Calvatias.)—Cyathus Berkeleyanus, or an African form of it. The spores, 3½ x 5, are the smallest I have ever seen in a Cyathus. The type form (otherwise the same) has spores 5 x 8.—Geaster saccatus—Fungus (?)—Scleroderma nitidum, a very peculiar species, otherwise similar to Scleroderma tenerum, but with a *long stalk*. The first specimen collected except in the type locality, Ceylon. There are two species of "stalked" Sclerodermas, but none known from either Europe or America—Cyathus (close to Montagnei), otherwise same, but with smaller spores (8 x 14)—Geaster mirabilis, beautiful specimens of a unique, typical species—Lycoperdon (cfr. fuligineum) immature, but very close—Unnamed species and genus as well. The peridium and habits are the same nature as Scleroderma tenerum, but it is very dark color. The spores are of a Lycoperdon (globose, smooth, 5-6 mic.), but I find *no capillitium*—Myxomycetes (3 collections).

MANIERE, LUCIENS, France:

Peziza coccinea (M. Boudier tells me that the plant we have in the United States under this name is not the same as the plant of Europe. They do not appear the same to me).

NISHIDA, TOJI, Japan:

Calvatia Gardneri (I think it will develop that this is the most common species of Asia. It was originally from Ceylon and called Lycoperdon Gardneri by Berkeley)—Phallus rugulosus (in alcohol). There are no color notes with it, but I have little doubt that it is this species. The pileus is more conical than shown in Fischer's figure, but otherwise agrees well. The apical collar is small, like a little knob, and is imperforate.

REA, CARLETON, England:

Polyporus radiatus—Polyporus crispus—Polyporus rutilans, of a firmer texture than usual, but it responds to the ammonia test—Polyporus chioneus?

RIVET, MONSIEUR, France:

Polyporus (cfr. varius). It was evidently shipped fresh and may have discolored in drying—Polyporus giganteus (?). Bad condition on account of having been shipped fresh.

SCHUPP, REV. A., Brazil:

Lycoperdon cepaeforme (or perhaps pusillum. It is large for pusillum, but has no sterile base)—Mycenastrum Corium, as it grows in every country of the world.

TORREND, REV. C., Portugal:

Poria (sp.)—Lycoperdon atropurpureum—Lycoperdon gemmatum—Polyporus (unknown to me)—Lycoperdon pusillum (?). Color too dark, but spores smooth and capillitium the same—Fomes rubriporus (Father Torrend states very common and attains a large size)—Geaster, form. Adventitious form, I think, with the fornicate exoperidium of coronatus and the ringed endoperidium of Bryantii—Lycoperdon gemmatum—Calvatia saccata—Scleroderma flavidum, in reality a small, thin, yellowish form of S. Geaster, common in the United States, but *rare* in Europe—Polyporus Schweinitzii "Grows 1½ feet broad"—Polyporus (sp.)—Poria (sp.)—Geaster triplex—Polyporus tubarius (new to my collection)—Fomes Ohiensis, new for Europe. Received as Fomes scutellatus, which is close and often confused, but I feel sure a distinct species. In either event its occurrence in Europe is another proof of the wide distribution of plants—Bovista plumbea—Polyporus rheades, new to me, but I judge it is this species—Bovistella Ohiensis—Polyporus leucomelas. The first I have from Europe and of much interest in connection with the question of the identity of Polyporus griseus of this country. I think now they are *color forms* of the same species. The "structure" is the same.—Trametes isabellinus (as labeled), unknown to me—Fomes jasmini—Polyporus dichrous—Polystictus perennis—Poria ambigua?—Poria (sp.)

TORREND, REV. C., Africa:

Polystictus funalis—Lenzites applanatus—Trametes rigida??—Hexagona polygramma—Fomes fusco-purpureus, resupinate (as labeled).

WEIDMANN, ANT., Austria:

Lenzites saepiaria, discolored—Lycoperdon gemmatum (form)—Fomes nigricans—Polyporus (sp.)—Polyporus Schweinitzii—Fomes pomaceus, I think. It differs from igniarius in the color of the context—Lenzites betulina—Calvatia saccata?—Lycoperdon (sp.)—Lycoperdon umbrinum.

C. G. LLOYD.

Paris, France, June, 1908.

LETTER No. 22.

We issue this letter to correct a mistake that we have just learned occurs in our pamphlet, Polyporoid Issue No. 1, page 7, where we refer Polystictus Montagnei as a synonym for Polysticus cinnamomeus. At the time we published that, our opinion was based on the examination of what we assumed were co-types of Polystictus Montagnei, in the herbarium of Montagne at Paris. We believed (and still believe, as we remember them) that they are the plant originally named from America as Polystictus parvulus, and which (following Bresadola's published views, as all recent writers have done) we referred to Polystictus cinnamomeus. There are in Fries' herbarium the original types, sent by Montagne, and also collections by Quélet which are the same plant, and as soon as we saw them we recognized that they can not possibly be our American plant, referred to above. Whether or not the co-types in Montagne's herbarium are the same as found in Fries' herbarium, we prefer not to say until we re-examine them, but from our recollection, they are not.

At any rate we were surely in error in publishing an opinion as to *Fries'* work on specimens found in *Montagne's* herbarium. We intend to "study the structure" (that is, examine the spores, which we have not yet done) and we anticipate that we shall decide that Polysticus Montagnei is a good species, and is the plant called in America Polystictus obesus, and that Morgan was right when he published it as Polystictus Montagnei.

In this connection it may not be amiss to state that there is a feeling creeping over me that it may be more correct to consider Polystictus Montagnei as an obese form of the plant published, Fungi Tridentini, plate xcix, as Polystictus cinnamomeus than to so refer our American plant.

In the complex problems presented by mycology every one is liable to make mistakes. I feel that it is each writer's duty to correct his own mistakes as soon as he finds them. It is no discredit to make mistakes, but it is not creditable to hide them.

C. G. LLOYD.

Upsala, Sweden, October 14, 1908.

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES

LETTER No. 23.

List of specimens received at Paris from the date of my arrival (July) up to the twelfth day of November, 1908.

I beg to thank my correspondents in Europe and foreign countries for their liberal sendings. I am now engaged in a study of the polyporoids of Europe, and have been greatly aided by the specimens received. I do not claim to have a critical knowledge of European species; in fact I am just making a good start. I spent three months this season in the woods of Sweden, and was enabled to satisfy myself as to many of Fries' species, largely aided by the advice and kindness of L. Romell, Stockholm, who has, I think, the best knowledge of any one of the Swedish species.

As to nomenclature—always a troublesome question owing to a variety of views on the subject—I have concluded to adopt the names used by *Elias Fries* for the polyporoids of Europe in most instances where I have no doubt as to Fries' views. I will explain my reasons for arriving at this decision in another letter, simply contenting myself to state here that the great majority of polyporoids are surely and definitely known by Friesian names, and that in my opinion it is not wise to go beyond Fries, and put aside what in most cases is a certainty for an uncertainty.

The American specimens that were crowded out of Letter No. 20 will be acknowledged in the next Letter devoted to American species. I am advised that a number of packages have been sent to my address at Cincinnati, that will shortly be forwarded to me at Paris.

C. G. LLOYD,
63 rue Buffon,
Paris, France.

December, 1908.

ALLEN, W. B., England:

Lycoperdon (? to me, but a form of nigrescens, I think).

BADET, REV. L., Italy:

Clathrus cancellatus (beautiful specimens).

BECKER, DR. H., South Africa:

Cyathus vernicosus. (The exterior hairs of the cup are more strongly developed than in the European form, approaching those of C. striatus, but the interior of the cup and the spores are the same as the type. One can not make a [good] new species on a character like this.)—Genus, unknown to me—Scleroderma Cepa—Calvatia, immature.

BERNARD, DR. CHARLES, Java:

Lycoperdon Wrightii (Spores are not truly globose, but it has all the essential characters of this species.)—Lycoperdon (species unknown to me.)—Genus unknown to me, immature—Lycoperdon (close to Wrightii)—Cyathus Poeppigii (as it develops that this is the most common Cyathus in the tropics, it is unfortunate that Tulasne gave it such an uncouth name).

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BEZZI, PROF. DOTT., Italy:

Rhizopogon rubescens—Polyporus squamosus—Polyporus adustus—Polystictus versicolor (dark, bluish form on Robinia, very close to what Fries called Polystictus azureus, from Mexico.)—Stereum hirsutum—Lenzites betulina—Lycoperdon polymorphum, a form with a slight development of the sterile base—Daedalea quercina—Fomes fraxineus (on Robinia).

BOORMAN, J. L., Australia:

(Sent in a package by Miss Margaret Flockton.) Polysaccum pisocarpium—Polysaccum crassipes—Calvatia olivacea (the spores are slightly but distinctly asperate)—Calvatia rubroflava, *of much interest!!* This species, as several times noted in my publications, is a rather rare puff ball in the United States. Then Father Rick sent it to me from Brazil. Recently I saw at Upsala, specimens from Argentina, South America, collected by Robert E. Fries. Mr. Boorman is the first to find it in Australia.

BRACE, L. J. K., Bahamas.

Schizophyllum umbrinum, at least I judge it is this species. It can well be called "umber," but it is not "lobed." It is much darker than the usual species, S. commune. Schizophyllum multifidum (only a form I think of commune)—Polystictus pinsitus—Microfungus—Calocera (sp.)—Trametes hydnoides—Also species unknown to me of Calocera, Thelephora and Cantharellus—Endogone macrocarpa, at least I judge it is this species.

BRANDIS, REV. E., Austria:

Polystictus hirsutus—Polyporus varius--Polyporus brumalis—Daedalea quercina—Polysticus pergamenus, a thicker, darker form than we have in the United States—Polystictus pergamenus, exactly the same form we have so common in the United States—Pleurotus ostreatus—Polyporus adustus—Polystictus versicolor—Trametes gibbosa—Fomes applanatus—Lenzites abietina (for me it is a form of Lenzites saepiaria)—Fomes pinicola—Polystictus cinnabarinus (on Cerasus)—Polystictus zonatus—Lycoperdon piriforme—Cyathus striatus—Panus rudis—Lycogala Epidendrum—Polyporus vulpinus, on Quercus Ilex. This is a rare plant in Europe. It has been found recently by J. Linds at Copenhagen, and by L. Romell near Stockholm, but in the north of Europe it seems to grow only on the poplar.—Scleroderma Cepa—Lycoperdon cepaeforme—Bovista plumbea.

BRAUN, DR. K., Deutsch Africa:

Lanopila bicolor (Doubtful to me as these are young specimens and have a well developed cortex. I am very well acquainted with this puff ball in a mature state when it has a perfectly smooth peridium. I can not be sure that these specimens with a distinct cortex are the same species.)

BUBÁK, PROF. DR. FR., Bohemia:

Polystictus abietinus—Polyporus amorphus—Polyporus adustus—Fomes annosus—Poria chrysoloma (as labeled)—Polyporus leporinus (a form circinatus, as labeled)—Polyporus borealis (?)—Polystictus velutinus—Polyporus fragilis—Fomes pomaceus—Stereum insigne (too close it seems to me to insignitum)—Polyporus brumalis—Polystictus hirsutus—Polyporus ovinus—Polyporus radiatus—Fomes roseus—Fomes Ribis—Fomes salicinus—Polyporus sulphureus—Poria taxicola—Polystictus versicolor—Polystictus zonatus. The above, with one or two exceptions, are all as labeled by Dr. Bubák.

CÉPEDE, C. France:

Bovista plumbea (discolored from having been sent preserved with some liquid)—Lycoperdon pratense—Daldinea concentrica.

CROSSLAND, CHARLES (specimens from India):

Polystictus xanthopus—Favolus tessellatus.

DUPONT, E., Reunion Island:

Scleroderma tenerum.

FLOCKTON, MARGARET, Australia:

Specimens marked with a * were collected by Miss Betts. Polysaccum pisocarpium—Strobilomyces (pallidus?)—Calvatia lilacina* (sterile base)—Scleroderma Cepa*—Scleroderma Cepa—Bovistella rosacea—Bovistella australiensis (?)—Scleroderma (cfr. verrucosum)—Lycoperdon cepaeforme—Clathrus gracilis, a fine collection, preserved in formalin, I think.

GILL, WALTER, Australia:

Calvatia lilacina—Calvatia gigantea, *oval spored form* which as far as known occurs only in Australia.

GONO, M., Japan:

Cyathus stercoreus (the only common Cyathus that grows in Japan)—Lycoperdon Wrightii.

HARIOT, P., France:

Polyporus radiatus, (on oak, Fontainebleau.)

von HÖHNEL, PROF. DR., Austria:

I have received from Prof. Dr. Franz v. Höhnel a most liberal shipment of the polyporoids. They were all named by Prof. v. Höhnel and most of them are listed here as named. In a number of instances they are species not familiar to me. Trametes gibbosa (pubescent form)—Trametes mollis (with a reflexed margin which is contrary to Fries' definition, but it is surely the plant, although I have heretofore only known Trametes mollis as a resupinate species)—Fomes fomentarius—Fomes marginatus (For me only a frondose form of pinicola)—Fomes pinicola—Polystictus biformis (It is a curious fact in plant distribution that this species which is frequent in the United States has been found to be not rare in *Eastern* Europe, as first announced, I think, by Bresadola. In *Western* Europe, I think it is very rare. I only know of one collection, by Rev. H. Bourdot, in France. Bresadola refers it now to cervinus of Schweinitz, with which I do not agree, but that is another story.)—Polyporus amorphus—Fomes igniarius—Fomes borealis (the "thick" form called by Fries "montanus")—Polyporus arcularius—Trametes rubescens—Polyporus sulphureus—Fomes annosus—Polyporus giganteus—Polystictus versicolor—Polystictus hirsutus—Polystictus perennis—Polyporus squamosus—Polyporus cuticularis—Trametes hispida—Polyporus dryadeus—Polyporus lucidus—Polyporus frondosus—Trametes suaveolens Favolus europaeus — Polyporus betulinus — Polystictus sanguineus (from Brazil) — Polyporus rutilans — Polyporus Schweinitzii — Trametes serialis—

Polystictus cinnabarinus—Polyporus crispus! This is a rare plant, often confused with adustus, but I think distinct.—Polyporus benzoinus—Polyporus melanopus—Polyporus hispidus—Daedalea unicolor—Polyporus croceus—Polyporus Broomei—Polyporus Braunii—Daedalea quercina—Fomes roseus—Polyporus caesius—Polyporus fumosus—Polyporus radiatus—Polyporus elegans—Polyporus adustus—Fomes Ribis—Polyporus varius—Poria kymatodes—Polyporus pallescens—Fomes igniarius (resupinate)—Poria sanguinolenta—Poria Vaillantii—Poria violacea—Poria contigua—Poria ambigua—Polyporus pubescens—Poria incarnata—Poria obducens—Poria rhodella—Poria salicina—Polyporus Hohnelianus (Mss. name)—Poria cinerescens—Polyporus polymorphus—Poria levis—Poria umbrina—Poria ferruginosa—Polyporus chioneus (resupinate)—Polyporus lacteus—Polyporus albidus—Poria eupora—Poria mollusca—Trametes micans—Fomes rubriporus—Fomes applanatus—Fomes corrugis, as labeled by Prof. v. Höhnel. It is unknown to me but seems very close to Fomes fraxineus. If correctly labeled, the plant has no relation to Polyporus lucidus, as placed by Fries.—Polyporus confluens (? to me, for it is not as "red" as dried specimens of confluens usually are.)—Trametes odorata—Fomes pomaceus—Fomes Hartigii (This form which grows on the Abies in Central Europe is now held to be the same as Fomes robustus on oak in Sweden.)—Polyporus ovinus—Polyporus Marianus (This is a species named by Bresadola, and as far as I can judge is a good "new species." When I first saw Dr. v. Höhnel's specimen I thought of connatus, but it has no cystidia and has different spores.)—Fomes laccatus. Under this name, which is attributed to Kalchbrenner, I received this plant from Dr. v. Höhnel, and notwithstanding that it is Fomes roburneus of Fries I shall adopt Kalchbrenner's name. "*A plant that is well named is half determined.*"—Fomes leucophaeus (?)—Polyporus brumalis (? not the usual form)—Poria obliqua—Polyporus leucomelas—Polyporus osseus (Nice specimen, and I think the first I have received. It is a species of Eastern Europe, not occurring as far as I know in Western Europe.)—Polyporus rufescens—Polyporus Weinmanni—Polyporus spumeus—Poria placenta (as labeled, but I think not. I do not know it, however.)—Daedalea unicolor (form)—Polystictus pergamenus—Polyporus triqueter (of Fries, of which a type is at Kew, I am told by Mr. Romell. I have not examined Persoon's herbarium, but I think it can not be his triqueter, which I judge from his writings is cuticularis)—Polyporus cristatus (Without having gone carefully into the question, I venture that the plant we know as flavo-virens in the United States will in time be found to be cristatus of Europe.)—Polyporus chioneus—Poria laevigata (?)—Polystictus fibula (A plant imperfectly known to me in Europe, but if this is correct I think it is the same as I have been calling Polystictus hirsutulus in the United States)—Polyporus nodulosus—Trametes gibbosa.

JAAP, PROFESSOR OTTO, Germany:

Poria sanguinolenta (*on earth!*)—Polystictus velutinus—Polystictus fibula (Not the same, I think, as the plant I received from Dr. v. Höhnel)—Polyporus rutilans—Polyporus varius—Polyporus mollis—Trametes odorata—Polyporus lacteus. All as labeled by Professor Jaap.

JARVIS, EDMUND, Australia:

Clathrus gracilis. This species reaches me more frequently than any other phalloid from Australia.

KLINCKSIECK, PAUL, France:
Polyporus resinaceus.

KRÜGER, PROFESSOR W., Germany:
Trametes odorata—Polyporus varius—Polyporus fumosus—Bovista nigrescens—Polystictus Montagnei (small specimen)—Polyporus brumalis (small specimen)—Lenzites saepiaria.

LIND, J., Denmark:
Fomes laccatus (This is known in Denmark as Fomes vegetus. I do not think Fomes vegetus of Fries is surely known, though often annular strata are interposed between the pore layers of Fomes applanatus, and this form is supposed to be what Fries called Fomes vegetus. The plant that Mr. Lind finds, Fries surely called Fomes roburneus according to the only authentic specimen known (at Kew). Kalchbrenner is said to have named the same plant Fomes laccatus, which impresses me as being a most excellent name for it, and I shall adopt it if I find it to be true. It is a pity it was not called resinosus, for it is the one plant in Europe that merits the name "resinosus." Usually it is a rare plant, but Mr. Lind finds it in abundance on poplar. Rev. Breitung has also found it near Copenhagen.—Poria sinuosa (as labeled. Unknown to me, but if it is correctly determined Poria sinuosa is no synonym for Poria Tulipiferae as often stated.)—Trametes odorata—Trametes suaveolens.

LUDWIG, MONSIEUR, France:
Poria undata (det. Bresadola)—Polyporus pubescens (det. Bresadola.) We have a common plant in the United States which passes for Polyporus pubescens, but it appears to me it can not be the same as this plant from Monsieur Ludwig.—Daedalea quercina—Also three Porias unknown to me.

LUJA, EDWARD, Congo:
Phallus indusiatus. The form from the Congo has the veil *united* into a membrane above, and the reticulations of the pileus are very pronounced. Mr. Luja sends me photographs of the fresh plant, some with pendant veils, others with spreading, bell-shaped veils.—Clathrus, unnamed, I think, very close to C. gracilis, but *orange*, not white.—Lanopila bicolor. There is no doubt in my mind that this is the original of Lanopila Wahlbergii, which was from Africa, but no type exists, hence it can not be proven.

MAIRE, PROFESSOR R., France:
Polyporus radiatus—Fomes annosus—Fomes fraxineus—Daedalea quercina—Polyporus rutilans—Polyporus caesius (on Fagus) Polyporus caesius (on pine)—Trametes Bulliardii (as known in France. In America it would be called Daedalea confragosa)—Daedalea unicolor—Fomes nigricans (as known in France. In Sweden it is the usual form of Fomes igniarius.)—Lenzites variegata (for me only a form of betulina)—Polyporus Schweinitzii—Trametes hispida—Trametes rhodostoma (New to me. Quélet gives this as a reddish variety of hispida. These specimens appear more rigid and the context is deeply colored. It seems to be a good form.)—Polystictus zonatus—Trametes serpens (as named)—Fomes applanatus (? young)—Poria vaporaria (as named)—Lycoperdon hungaricum—Lycoperdon fuscum—Lycoperdon pratense—

Scleroderma Cepa—Lycoperdon spadiceum—Lycoperdon umbrinum (?)—Lycoperdon gemmatum (*form*)—Lycoperdon nigrescens—Trametes Trogii (The context of this specimen is *pure white*)—Poria terrestris (in sense of Bresadola, I think)—Also three other Porias to me unknown, and a Fomes from Laconia.

MANIERE, L., France:

Scleroderma tenerum, a rare form in Europe.—Also dried, fleshy fungi, indeterminable by me.

MASSALONGO, PROFESSOR C., Italy:

Favolus europaeus, lenzitoid form!! While I feel sure Favolus europaeus is the same in Europe as in the United States, I do not recall ever having seen in our country a lenzitoid form.—Boletus subtomentosus—Boletus purpureus—Boletus versipellis—Hydnum imbricatum—Lactarius pubescens. The fleshy fungi are as named by Professor Massalongo.—Odontia tremniacensis (ad interim)—Solenia anomala—Himantia candida. (All as named by Professor Massalongo.)

MASSOTT, L., South Africa:

Cyathus vernicosus (Cups more flaring than the European form)—Cyathus stercoreus—Scleroderma Cepa.

NAVAS, REV. L., Spain:

Trametes hispida (form Trogii).

OLIVIER, ERNEST, France;

Fomes pomaceus (on Prunus Mahaleb) but doubtful, as I find no setae.—Polyporus hispidus (on Pommier)—Polyporus hispidus (on Aesculus Hipp.)—Daedalea quercina (on Quercus)—Fomes leucophaeus (on Hêtre)—Scleroderma verrucosum.

PETCH, T., Ceylon:

Scleroderma columnare (with a full description drawn from the fresh plant. The stalked Sclerodermas, true, of which there are three or four species in Asia and Africa are not known from Europe or America).

PIERRHUGUES, DR., France:

Polyporus elegans—Polyporus rutilans—Fomes rubriporus—Polyporus Schweinitzii—Trametes rufescens—Fomes applanatus—Fomes resinaceus—Polyporus hispidus (on Mûrier)—Polyporus tamaricis (on Tamarix)—Polyporus hispidus (on Pommier)—Fomes pomaceus.

PYAT, CAPITAINE FELIX, France:

Fomes applanatus—Daedalea quercina—Fomes rubriporus—Radulum quercinum—Fomes fraxineus—Daedalea, unknown to me—Polyporus lucidus—Lenzites tricolor, on Cerisier (Lenzites tricolor is for me a deeply colored lenzitoid form of Daedalea confragosa. It does not to my knowledge grow in America.)—Polystictus versicolor—Polyporus biennis—Trametes hispida—Lenzites betulina (typical, thick and rigid)—Trametes trabea (??) Lycoperdon spadiceum—Lycoperdon pusillum (dark form)—Calvatia saccata—Lycoperdon gemmatum—Lycoperdon (abnormal).

REA, CARLETON, England:

Bovistella paludosa. I am glad to receive this plant from Mr. Rea, as it is the first time, known to me, that the plant has been collected since originally discovered in France by Léveillé in 1845. Heretofore, the type specimens were all that were known.

RENAUDET, GEO., France:

Xylaria hypoxylon (conidial form).

RICK, REV. J., Brazil:

Cyathus stercoreus (In my opinion, although its habits are different. *It grew on rotten wood*, but has the same cups, peridioles and spores as the common manure species, Cyathus stercoreus—"Phallus rugulosus" as named by Rev. Rick—Cyathus Poeppigii—Laternea (unnamed species, I think; if not a laternea form of Clathrus chrysomycelinus. There is no *yellow* species of Laternea known). Calvatia (cfr. lilacina)—Calvatia (cfr. craniiformis).

SCHUPP, REV., Brazil:

Clathrus (species unknown to me).

SCHULTZE-WEGE, MADAME, Germany:

Fomes annosus—Trametes gibbosa—Polyporus betulinus—Polyporus adustus—Polyporus rutrosus (as labeled—unknown to me, but close to stipticus I think)—Polyporus vernalis (as labeled)—Fomes pomaceus—Polystictus versicolor—Polyporus amorphus—Polyporus radiatus—Fomes applanatus—Fomes leucophaeus—Lycoperdon perlatum.

SIMMONDS, J. H., Australia:

Calvatia lilacina (sterile base)—Nidula (? young, sterile)—Geaster (intermediate between saccatus and rufescens).

SWANTON, E. W., England:

Polyporus frondosus—Polyporus rutilans—Polyporus radiatus—Daedalea confragosa (Trametes form)—Trametes gibbosa—Polyporus varius—Also two Porias and two Polyporii unknown to me.

USSHER, C. B., Africa:

Calvatia lilacina—Phalloid. Surely an unnamed genus, I think. I can not well make it out from a dried specimen, but it is surely something novel.

VAN BAMBEKE, DR. CHARLES, Belgium:

Fomes conchatus—Fomes Ribis—Polyporus fumosus—Polystictus abietis—Polystictus cinnamomeus.

WILSON, JAMES, Australia:

Calvatia lilacina—Phalloid (undeveloped, genus doubtful)—Lycoperdon pratense—Lycoperdon cepæforme—Scleroderma flavidum—Cordyceps (sp. unknown to me)—Polysaccum pisocarpium—Stereum lobatum, I think.

WULFF, E., France:

Cfr. Dædalea unicolor—Lycoperdon pratense—Scleroderma verrucosum.

NOTE 1.

Fomes pomaceus.—The plant which I have previously called "Fomes fulvus, Scop. not Fr." following Rev. Bresadola, I have called in this letter and shall call in future Fomes pomaceus. That was the name given to it by Persooon and used by Fries, though the latter considered it a form of Fomes igniarius. It is a frequent plant; almost always in my observation on species of *Prunus*. Monsieur Hariot tells me it grows also on the apple tree (pommier) though that it is directly contrary to the testimony of Murrill. The name pomaceus is the usual name employed in France, and taking it in the broad sense to mean fruit trees in general, it is a good name for it, for this fungus is pre-eminently *the Fomes of the fruit trees*. The name Fomes prunastri also applied to it would be still better.

Usually the name "fulvus" is a very inappropiate name, for the plant is rarely fulvous even when young. I have a specimen from Dr. v. Höhnel that could truly be called "fulvus" but it is the only one I ever saw.

The name "fulvus" has been so bandied about in European mycology that it had better be relegated to the dump. Fries was evidently confused as to "Polyporus fulvus." His early account was probably Fomes pomaceus, though some of his remarks do not apply to it. His icones (Polyporus fulvus, original at Upsala) is I think without question the late fall condition of Polyporus corruscans, and is not a Fomes. His icones, published posthumously, which was made at Femsjo, under the direction of Lindblad, is in my opinion not the same species. His account (Hym Eur.) certainly does not apply to his icones (published) nor is there any Fomes known in Sweden to-day that agrees with it.

It is Fomes fulvus in the sense of Bresadola, not as to Scopoli. I am very skeptical as to any one knowing what Scopoli called "fulvus." It is not "fulvus" of Hartig; not "fulvus" of Schaefer; not "fulvus" of Marcucci; not "fulvus" of Quélet, all of which were different plants. There are too many "knots" in it. It is much better I think to drop the name.

NOTE 2.

Polyporus intybaceus.—"It has always been a puzzle to me whether this is Polyporus intybaceus or Polyporus frondosus, or whether these two are the same or different. Atkinson gives a good photograph of it under the former name."—Letter No. 10, July, 1906.

The above written from memory I find to be incorrect, and the word "latter" should have been used, as Atkinson called it Polyporus frondosus, which as I view it now is the correct name for the only plant of the two that I know. What Polyporus intybaceus is I have never been able to find out, though I think it is one of the popular errors in England due largely to Stevenson's cut to call Polyporus frondosus, Polyporus intybaceus. Fries was very positive that intybaceus was different from frondosus, though the distinction he makes is not clear to me, nor is the figure he cites, but I have probably never seen Fries' intybaceus which he records as a rare plant found in the province of Halland, Sweden.

LETTER No. 24.

PLANTS FROM MR. ROMELL.

I count among my best friends in Europe, Lars Romell of Stockholm. During the three seasons I have collected in Sweden, rarely a week passed that we did not spend a day together in the woods. Mr. Romell has studied the fungi of Sweden for twenty odd years, and I think he knows the Friesian species as no other man knows them to-day. I have learned more from Mr. Romell than from my own work. For three months the past season I collected at Upsala. At the end of the season I spent three days with Mr. Romell in his herbarium, and he kindly gave me specimens of everything he had that I had not collected in abundance. His herbarium is especially rich—the accumulation of twenty years' collecting, and he has many species that I did not find. The list herewith is mostly the names as given by Mr. Romell, though I have incorporated many remarks of my own, and Mr. Romell must not be held responsible for any of them, if any are wrong.

Polyporus giganteus. In Northern Sweden this is a rare plant, and this specimen grew on pine. In Southern Sweden it is more frequent on frondose wood.—Polyporus albidus. Grew on Abies, and has no red margin, and does not grow on Pinus sylvest. as stipticus should, otherwise it may be stipticus. (Spores 2½ x 5).—Fomes salicinus. On Lonicera, in a park, Stockholm. I find no colored setæ.—Poria corticola.—Polyporus lacteus. Rare on Fagus at Femsjo. —Polyporus chioneus.—Polyporus fumosus. A thin specimen, usually much thicker.—Polyporus fulvus, Fries' Icon. (not Hymen. Eur.) teste Romell. For me it is the late season's growth of Polyporus corruscans. It grows on oak, is rather rare in Sweden, and gets harder and longer pores as the season advances. Mr. Romell and I found at Dalby (Fries' favorite collecting grounds) the same plant on oak, soft and with short pores. This young plant appears to me to be exactly Polyporus corruscans, as described by Fries. Spores 6 x 8 mic., *colored*, smooth. The plant is very close to hispidus, where Fries placed it.—Polyporus floriformis (or stipticus). On pine, rare.="Polyporus floriformis, Quel. in Bres. Fung. Trident., desc. not icon. of Pol. trabeus in Rostk. It seems to me different from this species, but I do not know trabeus."—Bres.—Polyporus leporinus. Agrees with a specimen from Fries at Kew, teste Romell. (It is Polyporus triqueter, in the sense of Bresadola and Polyporus dualis of Peck.) It is not a rare plant on Abies stumps, near Stockholm.—Polyporus fragilis, on Abies.—Polyporus mollis, on Pinus sylv. It seems difficult to find any marked difference between mollis and fragilis.—Poria vulgaris var. calceus, on pine. When fresh the plant is white or pale yellow. Pores small, in strata which would indicate to me that it is perennial, but Mr. Romell claims not necessarily so.—Poria (sp.)—Poria mollusca, in the sense of Bres. Fung. Kmet. To me it is not in the sense of Fries. Spores subglobose 3–3½ mic.—Trametes micans, in the sense of Bresadola (not Fries, I think) albo-carneo-gilvus, Romell. On Quercus!—Poria ferrugineo-fusca, in the sense of Karsten=unita of Fries. This is a rare plant in Sweden, found by Mr. Romell but once, but then abundantly. Spores unknown—Poria lenis, in the sense of Karsten.—Polyporus triqueter, close to leporinus, except it is a thick plant and leporinus is a thin plant —Polyporus cuticularis, on beech in the South of Sweden.—Poria mol-

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lusca, as labeled.—Poria luteo-alba, as labeled.—Poria inconstans—Polyporus trabeus, teste Bresadola.—Polyporus vulpinus, from Dr. Haglund.—Daedalea unicolor, from Lapland. This species from Northern localities is not so thin and pliable as the more Southern species. I have noticed that even in Sweden.—Poria spongiosa, the *Fomes form*, very rare, teste Romell. Mr. Romell gave me also the "Poria" form, which it is difficult to believe is the same species.—Poria incarnata, as figured by Fries, teste Mr. Romell. On Abies.—Poria (sp.)—Porothelium fimbriatum, on Betula.—Stereum abietinum.—Stereum pini.—Hydnum strigosum, on Populus, in Northern Sweden (Umeå.) I would merely remark in passing that the plant from North America, included in Mr. Banker's paper under this name (juggled), based on a specimen in the herbarium of Schweinitz, has no resemblance to the species, in fact is not a Hydnum.—Lenzites heteromorpha. This is one of those polymorphic species that take hexagonal, irpicoid, and lenzitoid forms *in the same collection.* It grows only on Abies, and was previously unknown to me. It seems to me very close to Polystictus biformis.—Polyporus velutinus, form (for Mr. Romell.)—Polyporus croceus, on oak—Poria sp.—Merulius rufus on birch.—Solenia ochracea, on frondose wood.—Dædalea unicolor, on Abies. A rare host.—Merulius species—Solenia confusa (from Otto Jaap, Brandenberg)—Lenzites saepiaria, on Prunus!—Cyphella erucæformis, on poplar.—Stereum odoratum, on Abies.—Merulius serpens, on Abies.—Merulius Corium, not rare in Sweden.—Poria connata, on Acer. Cystidia abundant.—Merulius crispatus, teste Bresadola, on Salix Caprea.—Solenia urceolata, on birch.—Stereum ochroleucum, from Umeå, Northern Sweden. I think it is the same plant we have so common in the United States and which we call there Stereum versicolor or fasciatum.—Lenzites abietina (from Dr. Haglund).—Polyporus vulpinus. This is a rare plant in Sweden, and has only been found by Mr. Romell on poplar in recent years. Fries says "frequent, Upsala" but I did not find it at Upsala at all.—Poria cinerescens, vide Bresadola. (I am inclined to think this is Poria mollusca in the sense of Fries=also the specimen of subfusco-flavida in his herbarium).—Poria spongiosa, teste Bresadola. A rare plant in Sweden, and strongly marked by its "spongy" border. On Abies.—Polyporus (sp.) on Fraxinus at Sandemar.—Polyporus velutinus, from Upsala.—Poria squalens from Russia, on Pinus sylvestris. Spores 4 x 12, cyst. curved. Is it not callosa?—Poria obliqua, on Tilia, collected in May. Fomes vegetus, on oak, near Stockholm. Fomes vegetus is supposed to be only a condition of Fomes applanatus, with annual strata between the pore layers, such as is the normal condition of Fomes connatus.—Poria purpurea, on Alnus.—Trametes campestris, teste Patouillard, who tells me it is not a rare plant in France. I can not believe it is the same as Trametes micans, as has been stated.—Polystictus versicolor, form, at Femsjo. Certainly a most marked form.—Poria obliqua. This is a peculiar species of Sweden. I do not know whether it grows in the United States or not. What Berkeley so referred from Lea has no resemblance. It begins under the bark of live trees, Betula, Populus, Ulmus, and ends by killing the bark.—Fomes salicinus, on Viburnum.—Poria nitida, on Fagus, Femsjo.—Poria obliqua, on Ulmus.—Poria radula, from England. It is Poria vaporaria, in the sense of the English mycologists; surely not in the sense of Fries.—Poria mollusca, teste Bresadola, on frondose wood.—Poria punctata, on Salix. (Mr. Romell thinks the type specimen is on frondose wood, not

Abies, as stated in Hym. Eur.) Moreover it is doubtful if it is other than resupinate igniarius.—Poria sanguinolenta, on pine.—Polystictus versicolor, pale form.—Poria violacea, in the sense of Fries Hym. Eur. (for me). You can call it Poria taxicola in the sense of Bresadola, Poria sorbicola in the sense of Weinmann, Merulius Ravenelii in the sense of Berkeley (and also Peck,) Merulius serpens in the sense of Ravenel, Poria violacea in the sense of Ellis, Merulius petropolitanus in the sense of Fries Icones at Stockholm, and the returns are not all in as yet.—Poria incarnata, as figured by Fries, teste Mr. Romell. Stockholm, on Abies.—Fomes robustus (young) on oak.—Merulius porinoides, teste Bresadola.—Solenia candida, on Betula.—Pterula multifida. Mr. Romell found it abundant in a park at Stockholm. Fries records that he knew but one station for it.

CONTINUATION OF LETTER No. 20.

THE FOLLOWING ACKNOWLEDGMENTS WERE CROWDED OUT OF LETTER NO. 20.

NOBLE, MRS. M. A., Florida:

Polyporus Curtisii.

ROLFS, P. H., Florida:

Scleroderma Geaster (young) — Lycoperdon pusillum — Tylostoma floridanum—Geaster texense—Sclerotia of Hypochnus ochroleucus, teste Professor Burt, as published by F. L. Stevens (Science, vol. 26, p. 724). I am inclined to be skeptical for I think Professor Stevens does not establish any connection between the fungus he finds on the leaves and these scale-like masses on the stem.

SETCHELL, PROFESSOR W. A., California:

Cyathus vernicosus—Secotium tenuipes (co-types!!). The plant is quite distinct from the plant Mr. Long found in Texas. Spores are 10 x 16—Tylostoma albicans (from Arizona).

SMITH, PROFESSOR G. D., Ohio:

Polystictus versicolor—Polyporus (sp.) — Poria (sp.) —Auricularia auricula-Judae—Trametes abietis — Fomes conchatus — Polyporus gilvus — Daldinea concentrica—Peziza floccosa—Verpa digitaliformis (received fresh)—Tremella foliacea (at least so called by Morgan)—Gyromitra brunnea—Lycoperdon separans—Poria (sp.)—Polyporus fumosus—Lenzites sepiaria—Polyporus (sp.)—Merulius (sp. unknown to me)—Polyporus picipes—Tremella clavarioides—Geaster minimus—Scleroderma tenerum—Isaria farinosa—Merulius tremellosus—Irpex lacteus—Cordyceps militaris—Geaster saccatus—Lycoperdon atropurpureum—Polyporus pubescens—Polyporus adustus—Poria (sp.) — Polyporus rutilans — Lycoperdon piriforme — Polystictus conchifer — Poria tulipifera—Polyporus (sp.)—Lenzites saepiaria—Fomes pinicola (short, concentric, sulcate)—Polyporus frondosus—Polyporus arcularius—Polyporus brumalis—Hypoxylon (sp.)—Corticium salicinum—Stereum bicolor—Trametes sepium—Calvatia elata—Lenzites betulina—Sebacina pallida—Crucibulum vulgare—Polystictus pergamenus—Lycoperdon floccosum—Stereum complicatum—Hydnum ochraceum—Stereum versicolor—Cyathus Schweinitzii—Daldinea concentrica—Poria ambigua?—Mould (?) on decaying agarics—Polystictus perennis — Phalloid pileus — Polystictus hirsutus — Hydnum (sp.) —

Lycoperdon subincarnatum — Fomes fomentarius — Favolus europaeus—Fomes connatus—Lycoperdon cepaeforme—Daedalea confragosa (thin form)—Phlebia radiata—Polystictus versicolor — Urnula Craterium — Polyporus reniformis—Polystictus biformis—Polyporus cuticularis—Polyporus adustus (cfr. borealis)—Daedalea confragosa, unquestionably a form in my opinion, but very different from the usual form in being *velutinate*. I have this same form from Europe, but this is the first specimen from this country—Daedalea unicolor—Polyporus lucidus—Daedalea confragosa (normal form)—Scleroderma aurantium—Hydnum adustum—Fomes leucophaeus, with a distinct stem—Polyporus dichrous—Geaster triplez—Hydnum (sp.)—Stereum rubiginosum—Scleroderma Cepa—Stereum sericeum—Fuligo (sp.)—Lycoperdon Wrightii—Geaster rufescens—Polystictus conchifer—Polyporus dryadeus. This is an exceedingly rare plant in this country, although it has been recorded by Schweinitz and others. Schweinitz's work was a bad determination, his specimens being Polyporus gilvus, a species he had "discovered" himself. Professor Smith is the only one to find Polyporus dryadeus in this country to my certain knowledge—Polyporus (unknown to me). I half way suspect it is an old condition of Pol. Pilotae, but I do not know—Gomes conchatus—Poria (sp.)—Photographs, beautiful photographs of Gyromitra brunnea, Morchella conica and Verpa digitalis.

STEVENS, F. L., North Carolina:

Thelephora retiformis (or Septobasidium retiforme as now called by Patouillard).

SUTLIFF, M. L., California:

Lycoperdon gemmatum—Lycoperdon cupricum.

TUCKER, MRS. SUSAN, Washington:

Geaster asper—Geaster floriformis. Mrs. Tucker writes me that this species proves quite a pest in her flower beds—Rhizopogon (sp.)—Lycoperdon pusillum—Nidula microcarpa—Lycoperdon polymorphum. This has a well developed base, same as in Europe, and I think only occurs in our Northwest. The usual form, with a very scanty, sterile base (L. cepaeforme), is quite common over the United States)—Bovista plumbea, a large form that occurs in the West—Calvatia caelata (form)—Catastoma subterraneum—Calvatia occidentalis—Lycoperdon (sp.).

WHETZEL, H. H., Indiana:

Geaster saccatus.

WILDER, CHARLOTTE M., California:

Calvatia occidentalis—Bovistella dealbala (Some of these specimens are *brown*. Same color as bovista brunnea of New Zealand, but the cortex is smooth, and it has recently developed that Bovista brunnea has a cortex of small spines.)—Geaster floriformis.

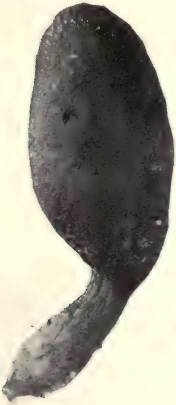
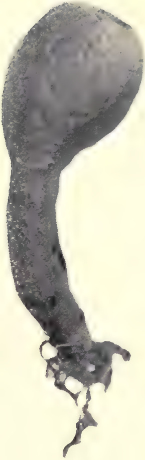


Fig. 1.



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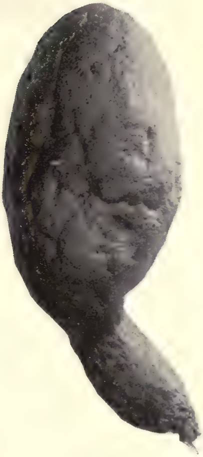

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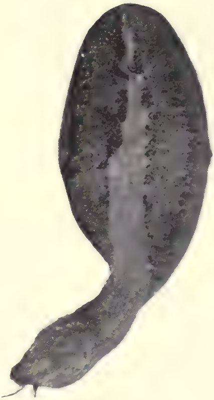


Fig. 4.

Explanation of Figures.

Fig. 1, 2 & 3 from alcoholic specimens from A. S. Bertolet, Alabama. Fig. 4. Section. (Compare also Plate 12.)

CAULOGLOSSUM TRANSVERSARIUM.

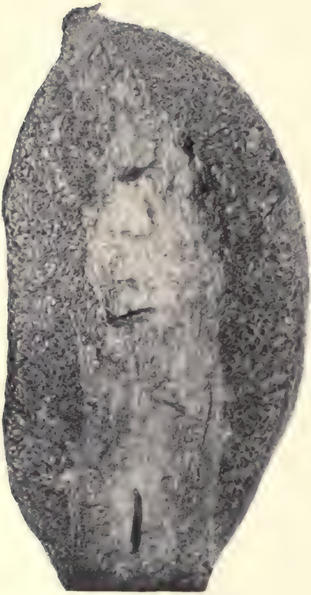


Fig. 5.

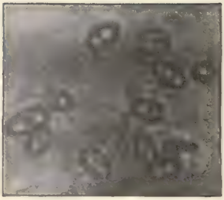


Fig. 6.

Explanation of Figures.

Fig. 5. Section enlarged 5 times. Fig. 6. Spores (x 1000).

CAULOGLOSSUM TRANSVERSARIUM.

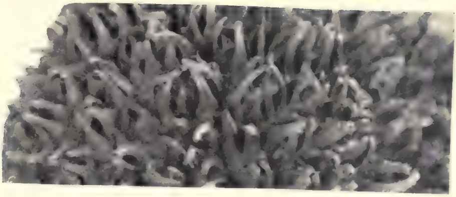


Fig. 1.

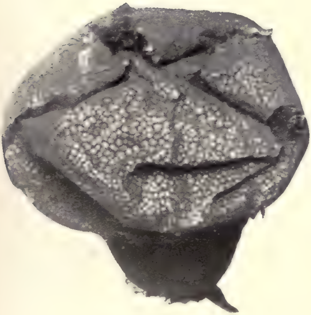


Fig. 2.

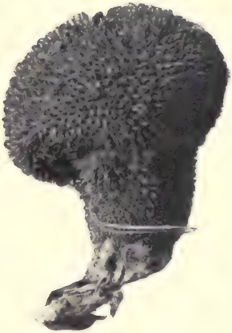


Fig. 3.

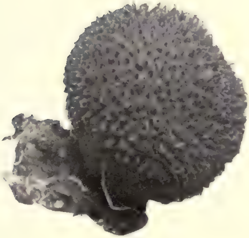


Fig. 4.

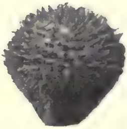


Fig. 5.

Explanation of Figures.

Fig. 1. Cortex enlarged four times. Fig. 2. Plant in herbarium of Prof. Magnus, Berlin. Figs. 3 and 5, from J. Lagarde, France. Fig. 4, from Wm. L. W. Eyre, England.

LYCOPERDON ECHINATUM.

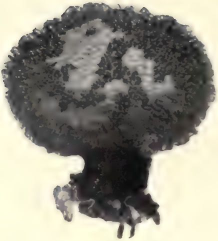


Fig. 6.

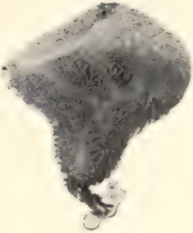


Fig. 7.

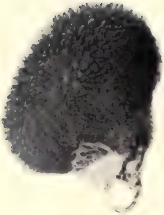


Fig. 8.

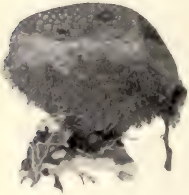


Fig. 9.

Explanation of Figures.

Figs. 6, 7, 8 and 9. Plants from A. P. Morgan, Ohio.

LYCOPERDON ECHINATUM.

Issued by C. G. LLOYD.

PLATE 42.

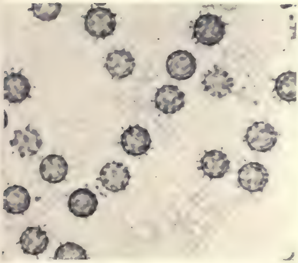


Fig. 1.

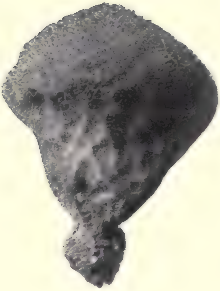


Fig. 2.

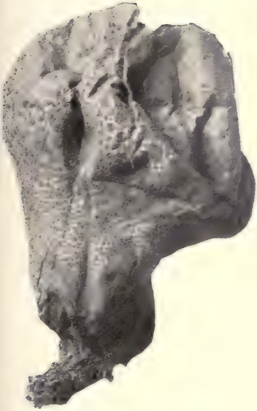


Fig. 3.

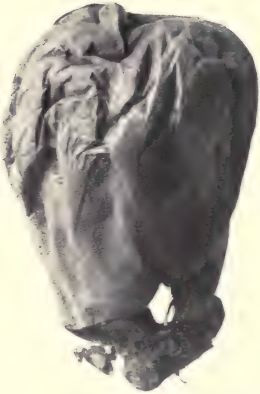


Fig. 4.

Explanation of Figures.

Fig. 1. Spores (x1000) Microphotograph by Prof. E. W. D. Holway. Fig. 2. From Rev. C. Torrend, Portugal. Figs. 3 and 4. From J. Lagarde, France.

LYCOPERDON ATROPURPUREUM.

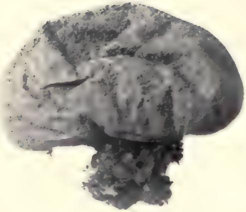


Fig. 5.

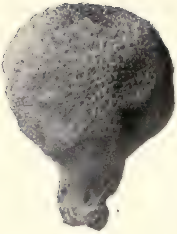
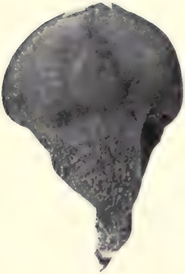


Fig. 6.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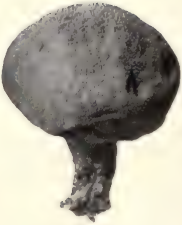


Fig. 8.

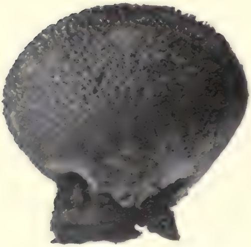


Fig. 9

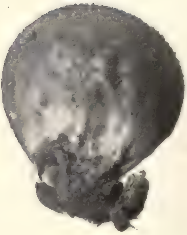


Fig. 10.

Explanation of Figures.

Fig. 5. From L. Romell, Sweden. Fig. 6. Johanna Schultze-Wege, Germany. Fig. 7. O. Mattirolo, Italy. Fig. 8. A. Weidmann, Austria. Figs. 9 and 10. A. P. Morgan, Ohio.

LYCOPERDON ATROPURPUREUM.

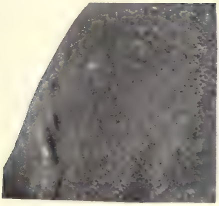


Fig. 1.

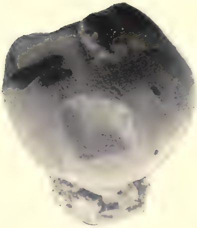


Fig. 2.

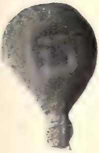


Fig. 3.

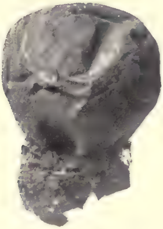


Fig. 4.

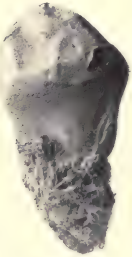


Fig. 5.

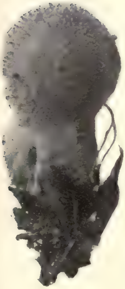


Fig. 6.

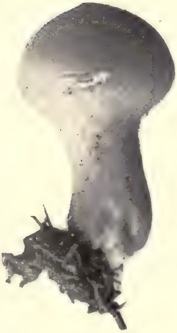


Fig. 7.

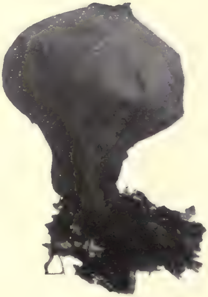


Fig. 8.

Explanation of Figures.

Fig. 1. Cortex enlarged. Fig. 2. From A. P. Morgan, Ohio. Fig. 3. Rev. C. Torrend, Portugal. Fig. 4. L. Rolland, France. Fig. 5. M. Bezzi, Italy. Figs 6, 7 and 8, C. G. Lloyd, Sweden.

LYCOPERDON UMBRINUM.*

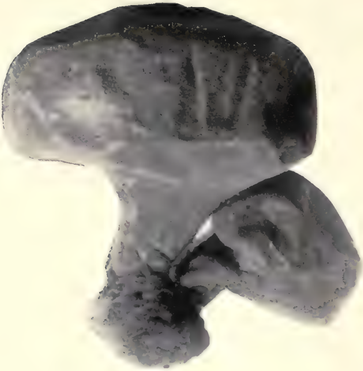


Fig. 9.

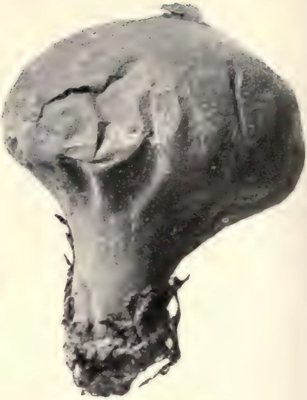


Fig. 10.

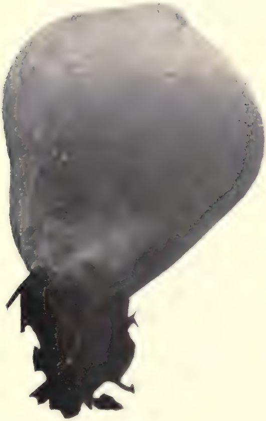


Fig. 11.

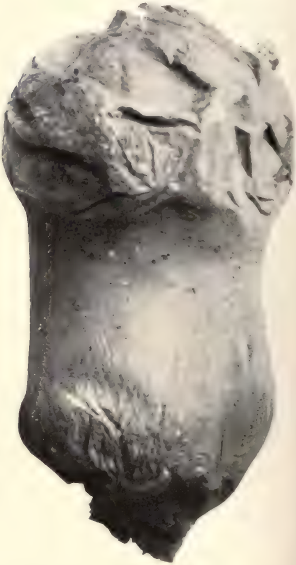


Fig. .2.

Explanation of Figures.

Fig. 9. From A. P. Morgan, Ohio. Fig. 10. M. Maingaud, France. Fig. 11. C. G. Lloyd, Sweden. Fig. 12. N. Patouillard, France.

LYCOPERDON UMBRINUM.*

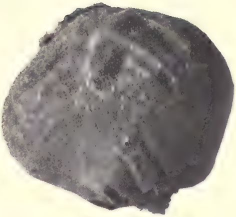


Fig. 1.

Explanation of Figure.

Fig. 1. Plant from Rev. C. Torrend, Portugal.

LYCOPERDON DELICATUM.*

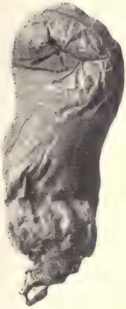


Fig. 2.

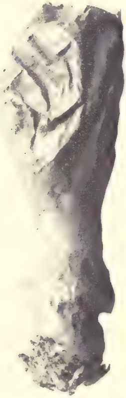


Fig. 3.

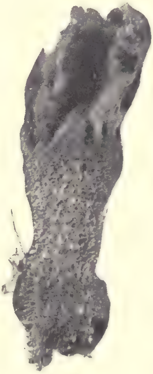
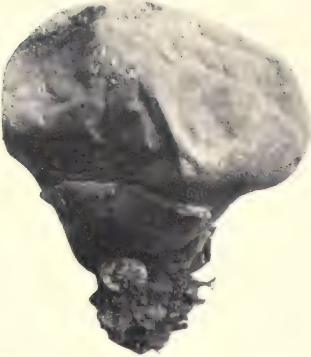


Fig. 4.

Explanation of Figures.

Fig. 2. From Rev. C. Torrend, Portugal. Figs. 3 and 4. Johanna Schultze-Wege, Germany.

LYCOPERDON ELONGATUM.*



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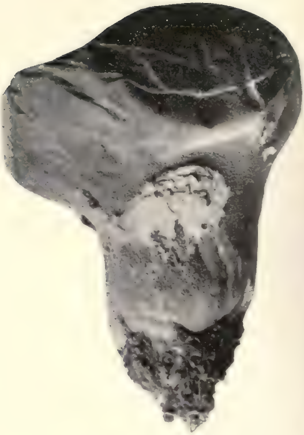

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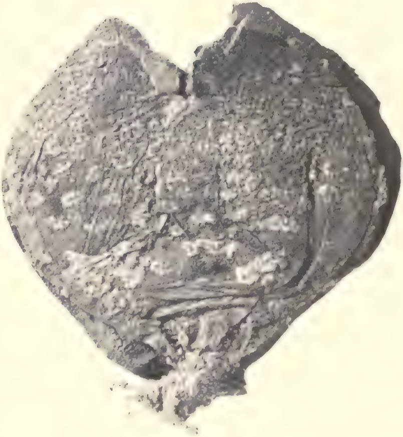

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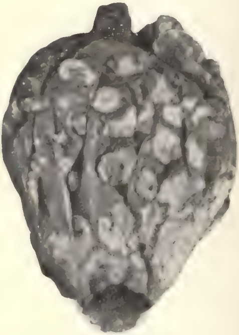


Fig. 8.

Explanation of Figures.

Fig. 5 and 6. Plants from N. Patouillard, France. Fig. 7. Plant in herbarium Desvaux, Museum of Paris. Fig. 8. Type specimen from Vittadini, at Kew.

LYCOPERDON VELATUM.

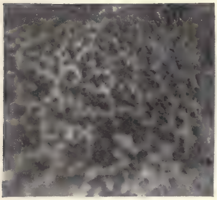


Fig. 1.

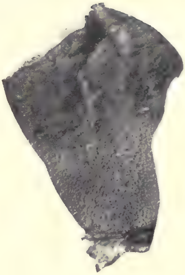


Fig. 2.

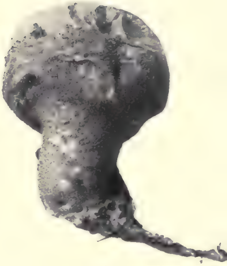


Fig. 3.

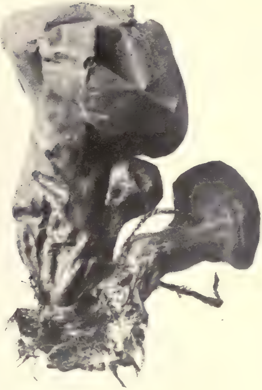


Fig. 4.

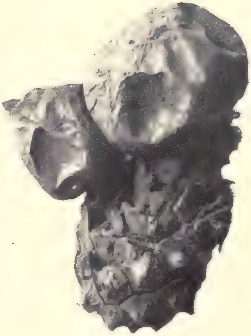


Fig. 5.

Explanation of Figures.

Fig. 1. Cortex enlarged. All plants from A. Weidmann, Austria.

LYCOPERDON CUPRICUM.

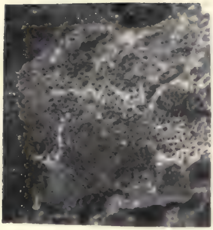


Fig. 1.

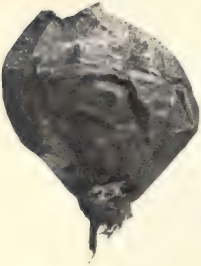


Fig. 2.

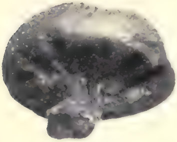


Fig. 3.

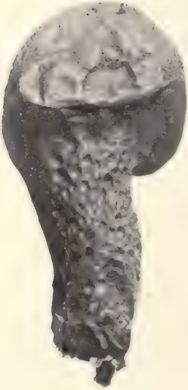


Fig. 5.

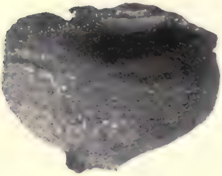


Fig 4.

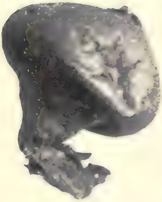


Fig. 6.

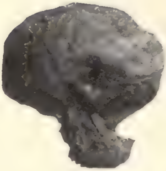


Fig. 7.

Fxplanation of Figures.

Fig. 1. Cortex enlarged. Fig. 2. From J. Lagarde, France. Fig. 3. Rev. C. Torrend, Portugal. Figs. 4, 5, 6 and 7, C. G. Lloyd, West Virginia.

LYCOPERDON FUSCUM.

PLATE 46.

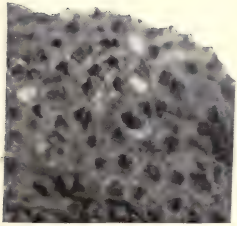


Fig 1.

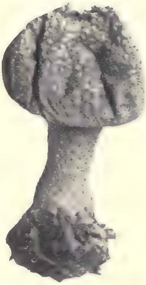


Fig. 2.

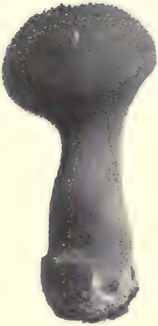


Fig. 3.

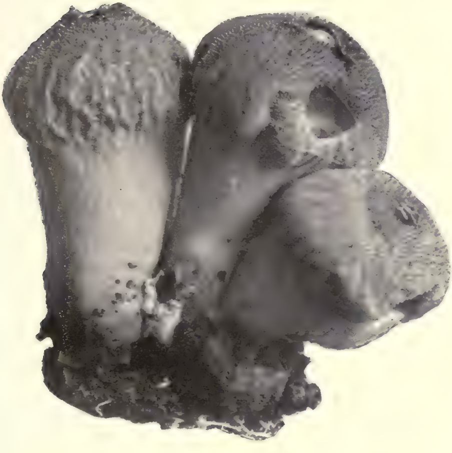


Fig. 4.

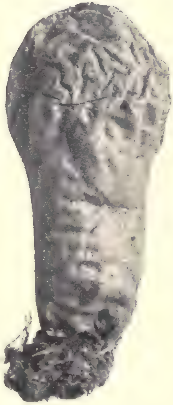


Fig. 5.

Explanation of Figures.

Fig. 1. Cortex enlarged. Figs. 2 and 5. From L. Romell, Sweden. Fig. 3. L. H. Watson, Illinois. Fig. 4. C. G. Lloyd, Cincinnati.

LYCOPERDON GEMMATUM.

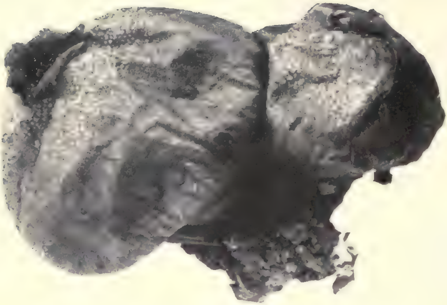


Fig. 6.

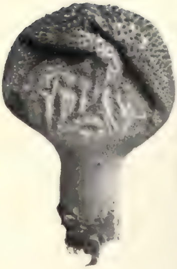


Fig. 7.

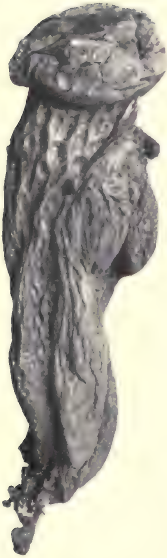


Fig. 8.

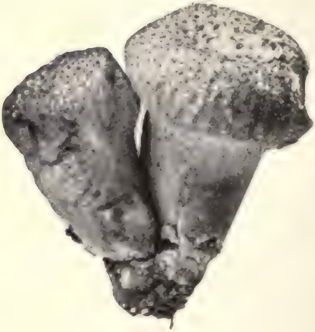


Fig. 9.

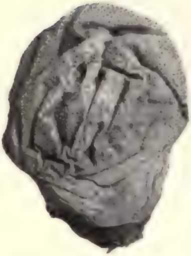


Fig. 10.

Explanation of Figures

Figs. 6 and 9. From C. G. Lloyd, Cincinnati. Fig. 7. L. Romell, Sweden. Fig. 8. Annie L. Smith, England. Fig. 10. Johanna Schultze-Wege, Germany.

LYCOPERDON GEMMATUM.

PLATE 47.

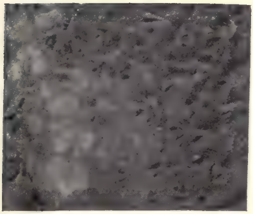


Fig. 1.

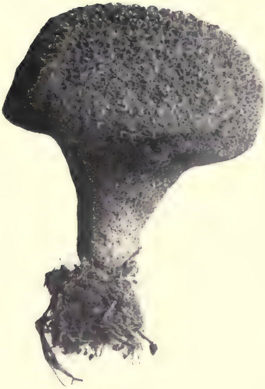


Fig. 2.

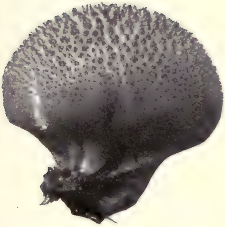


Fig. 3.

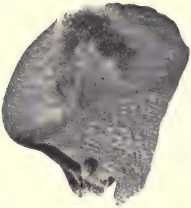


Fig. 4.

Explanation of Figures,

Fig. 1, Cortex enlarged. Fig. 2, Plant from Mary L. Miles, Scotland. Figs. 3 and 4, C. G. Lloyd, Sweden.

LYCOPERDON NIGRESCENS.

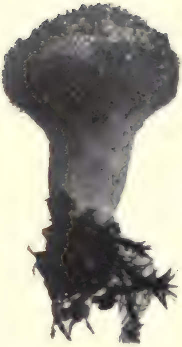


Fig. 5.

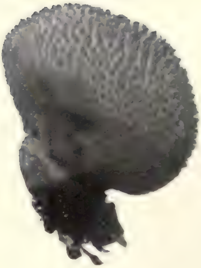


Fig. 6

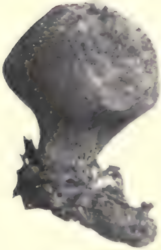


Fig. 7.

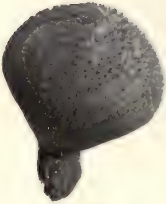


Fig. 8.

Explanation of Figures.

All from C. G. Lloyd, Sweden. Figs. 3, 5 and 6 were photographed from fresh specimens.

LYCOPERDON NIGRESCENS.

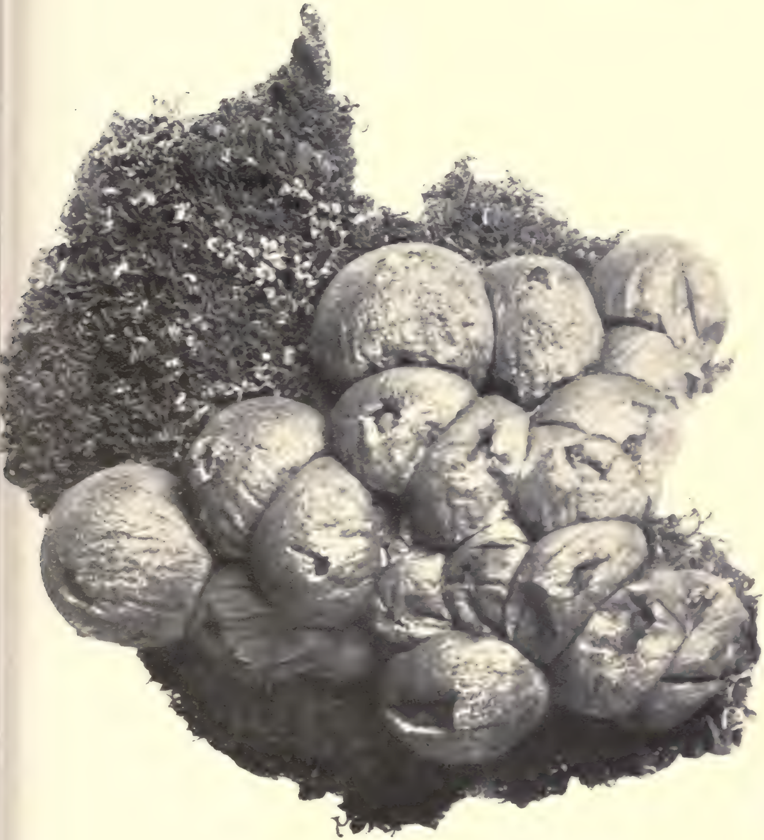


Fig. 1.

Explanation of Figure.

Old specimens in situ, near Cincinnati.

LYCOPERDON PIRIFORME.

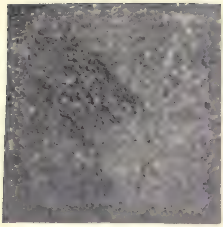


Fig. 2.

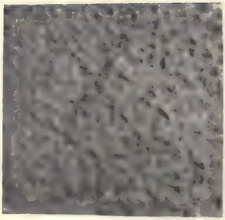


Fig. 3.

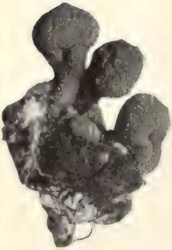


Fig 4.

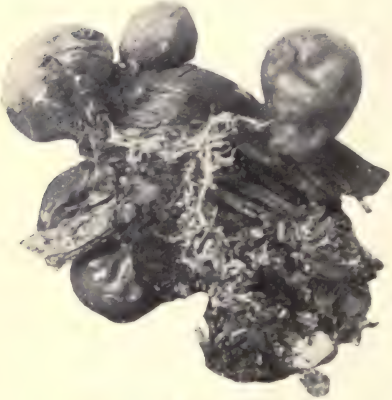


Fig. 5.

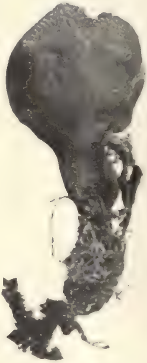


Fig. 6.

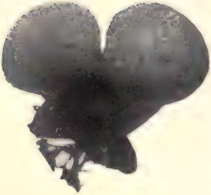


Fig. 7.

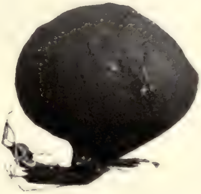


Fig. 8.

Explanation of Figures.

Figs. 2 and 3, Cortices enlarged. Fig. 4, From Otto Jaap, Germany. Fig. 6, From Mary L. Miles, Scotland. Fig. 8, From Wm. L. W. Eyre, England. Figs. 5 and 7, From C. G. Lloyd.

LYCOPERDON PIRIFORME.

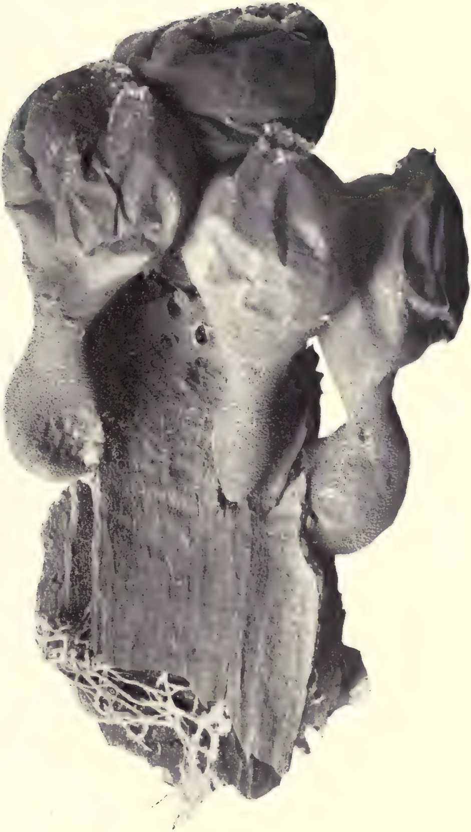


Fig. 1.

Explanation of Figure.

Fig. 1, Plants collected near Upsala, Sweden, by C. G. Lloyd.

LYCOPERDON DESMAZIERES.*

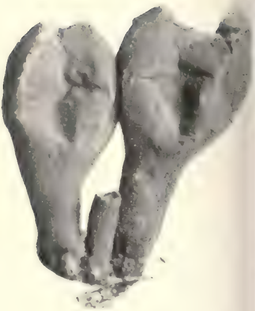


Fig. 3.

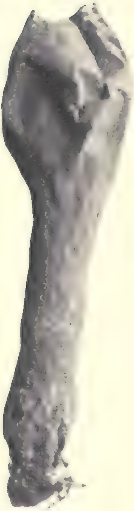


Fig. 2.

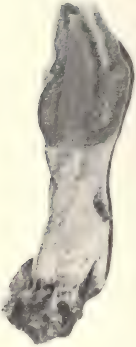


Fig. 4.

Explanation of Figures.

Figs. 2 and 3. Plants From L. Rolland, France. Fig. 4. From Johanna Schultze-Wege, Germany.

LYCOPERDON DESMAZIERES.*

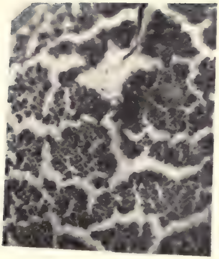


Fig. 1.

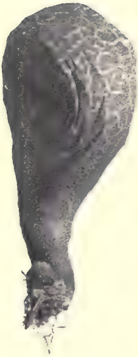


Fig. 2.

Explanation of Figures.

Fig. 1, Cortex enlarged. Fig. 2, Plant from L. Romell, Sweden.

LYCOPERDON SEROTINUM.

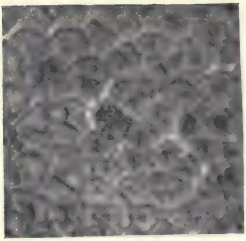


Fig 3'

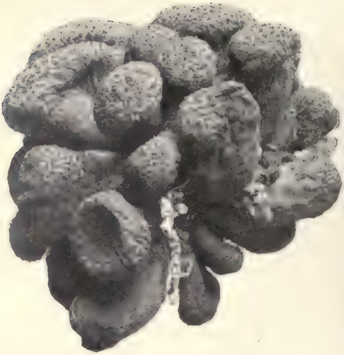


Fig. 4.

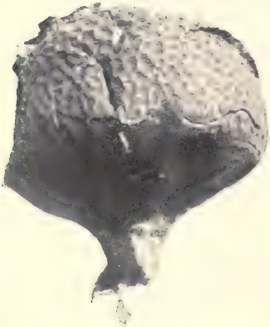


Fig. 5.

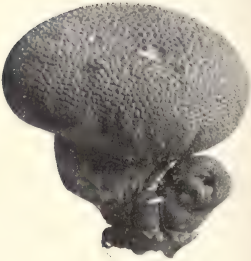


Fig. 6.

Explanation of Figures.

Fig. 3, Cortex enlarged. Fig. 4, Plants from R. B. Mackintosh, Massachusetts. Fig. 5, From H. B. Dorner, Indiana. Fig. 6, From Rev. J. M. Bates, Nebraska.

LYCOPERDON TESSELLATUM.*

Issued by C. G. LLOYD.

PLATE 51.

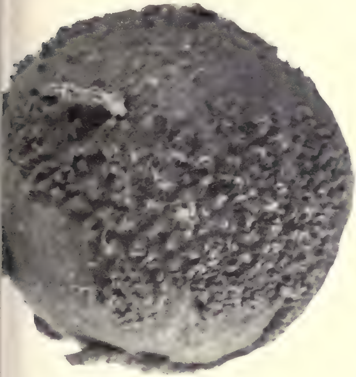


Fig. 1.

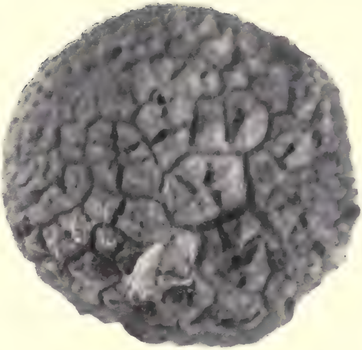


Fig. 2.

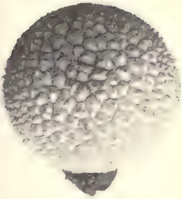


Fig. 3

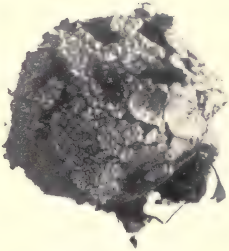


Fig. 4.

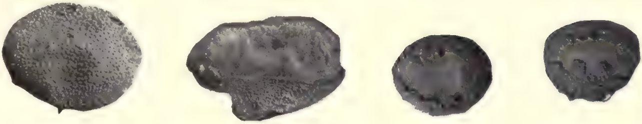


Fig. 5.

Explanation of Figures.

Figs. 1 and 2, Small plants enlarged. Fig. 3, Cortex before breaking. Fig. 4, Cortex breaking. Fig. 5, Plants from O. Mattirolo, Italy.

LYCOPERDON CRUCIATUM.

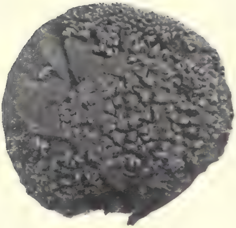


Fig. 6.

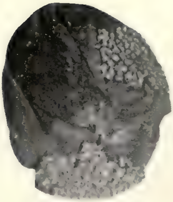


Fig. 7.

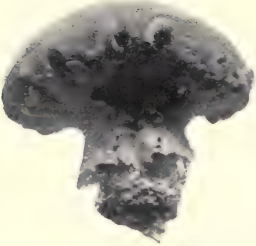


Fig. 8.

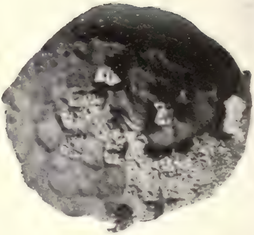


Fig. 9.

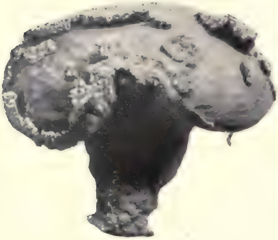


Fig. 10.

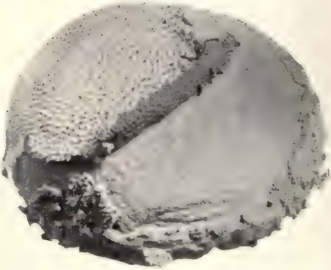


Fig. 11.

Explanation of Figures.

Fig. 6, Plant from France in Museum at Paris. Fig. 7, Plant from Germany in Museum at Berlin. Figs. 8, 9, 10 and 11, from Cincinnati.

LYCOPERDON CRUCIATUM.

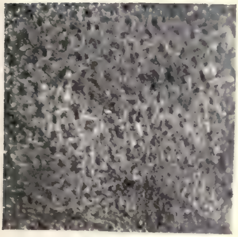


Fig. 1.

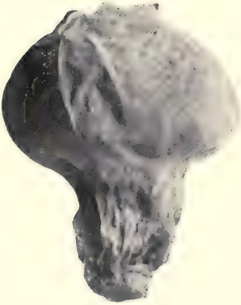


Fig. 2.

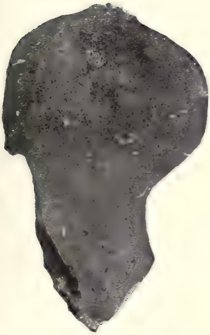


Fig. 3.

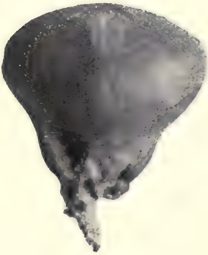


Fig. 4.

Explanation of Figures.

Fig. 1, Cortex enlarged. Figs. 2, 3 and 4, see over.

LYCOPERDON POLYMORPHUM.

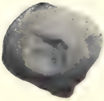


Fig. 5.

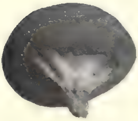


Fig. 6.

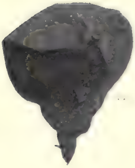


Fig 7.

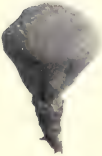


Fig. 8.

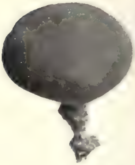


Fig. 9.

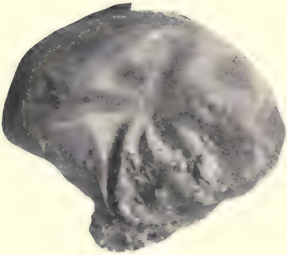


Fig. 10.

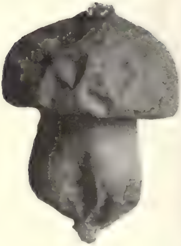


Fig. 11.

Explanation of Figures.

Fig. 7, Type from Vittadini in Museum at Paris. Figs. 2, 3, 4. 5, 6, 8, 9, 10 and 11, Plants all from Rev. C. Torrend, Portugal, and all same collection.

LYCOPERDON POLYMORPHUM.

PLATE 53

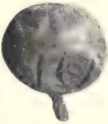
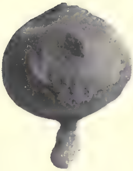


Fig. 1.

Fig. 2.


Fg. 3.

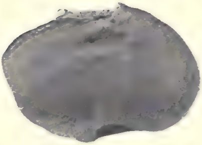


Fig. 4.

Explanation of Figures.

Figs. 1, 2 and 3, From Hollis Webster, Massachusetts. Fig. 4, From L. R. Waldron, Michigan.

LYCOPERDON CEPAEFORME.

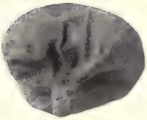


Fig. 5.

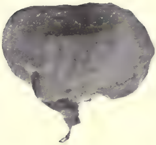


Fig. 6.

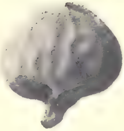


Fig. 7.

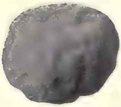


Fig. 8.

Explanation of Figures.

Figs. 5, 6, 7 and 8, From Rev. C. Torrend, Portugal.

LYCOPERDON HUNGARICUM.

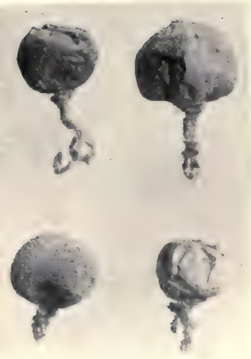


Fig. 9.

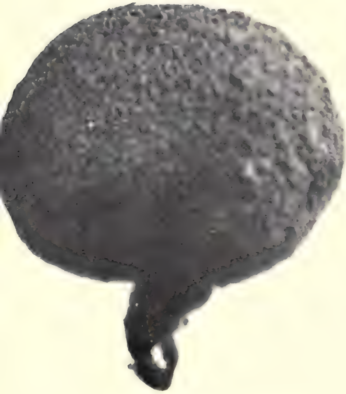


Fig. 10.

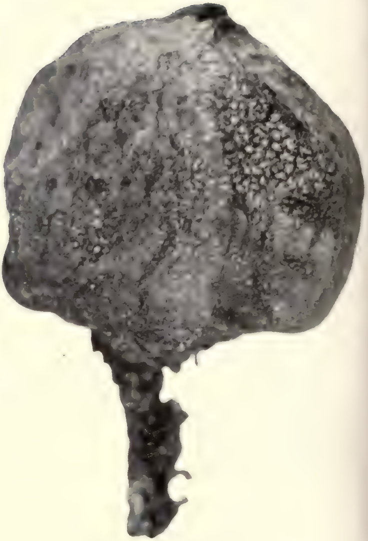


Fig. 11.

Explanation of Figures.

Fig. 9, Plants from M. Bezzi, Italy. Fig. 10, Young plant enlarged 5 times. Fig. 11, Old plant, enlarged 5 times.

LYCOPERDON PUSILLUM.

PLATE 54.

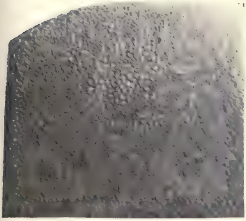


Fig. 1.

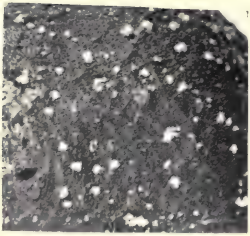


Fig. 2.

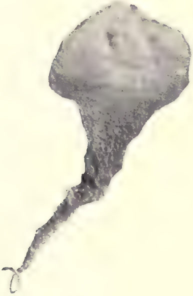


Fig. 3.

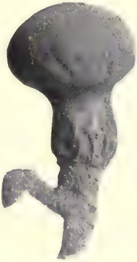


Fig. 4.

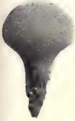


Fig. 5.

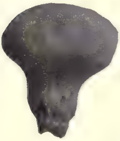


Fig. 6.

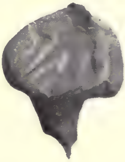


Fig. 7.

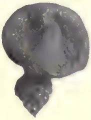


Fig. 8.

Explanation of Figures.

Fig. 1, Cortex enlarged. Fig. 2, Cortex with lime deposit, enlarged. Fig. 3, From L. Rolland, France. Fig. 4, From Dr. Hollos, Hungary. Figs. 5, 6, 7 and 8, From J. Lind, Denmark.

LYCOPERDON SPADICEUM.

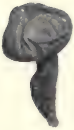


Fig. 9.

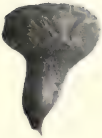


Fig. 10.

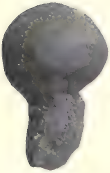


Fig. 11

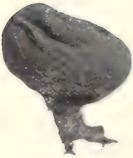


Fig. 12.

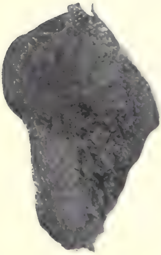


Fig. 13.

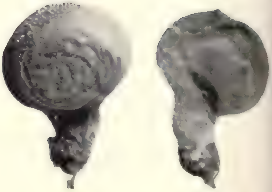


Fig. 14.

Explanation of Figures.

Figs. 9 and 10, Plants from Madame Rousseau, Belgium. Fig. 11, From Dr. Hollos, Hungary. Fig. 12, From L. Rolland, France. Fig. 13, From A. Weidmann, Austria. Fig. 14, From N. Patouillard, France.

LYCOPERDON SPADICEUM.

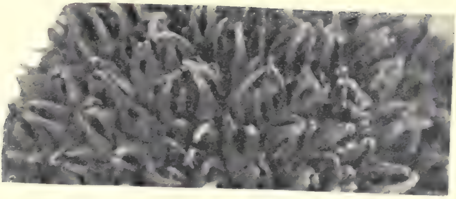


Fig. 1.

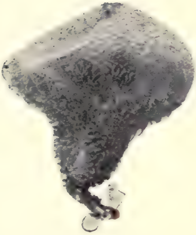


Fig. 2.

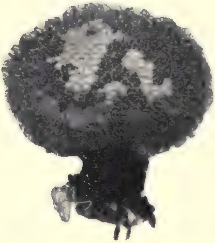


Fig. 3.

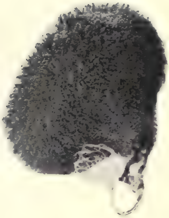


Fig. 4.

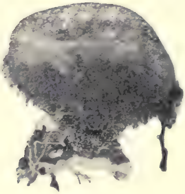


Fig. 5.

Explanation of Figures.

Fig. 1, Cortex enlarged. Specimens are from A. P. Morgan, Ohio.

LYCOPERDON ECHINATUM.

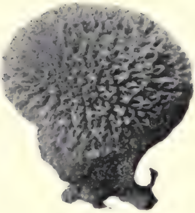


Fig. 1.

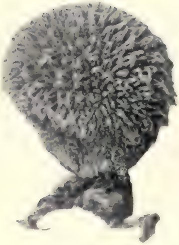


Fig. 2.

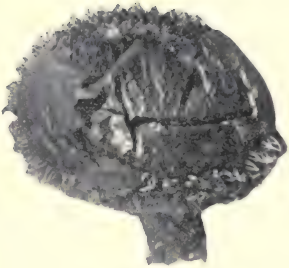


Fig. 3.

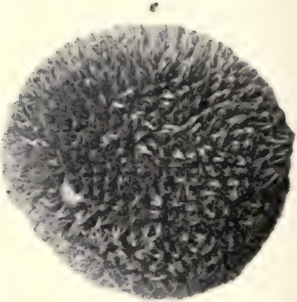


Fig. 4.

Explanation of Figures.

Specimens from A. P. Morgan, Ohio.

LYCOPERDON PULCHERRIMUM.

Issued by C. G. LLOYD.

PLATE 56.

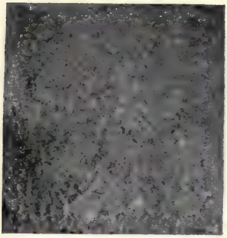


Fig. 1.

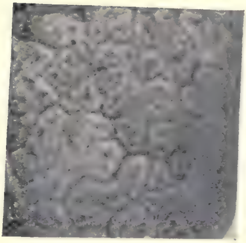


Fig. 2.

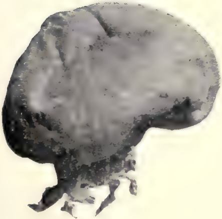


Fig. 3.

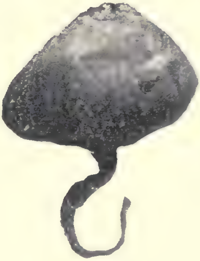


Fig. 4.

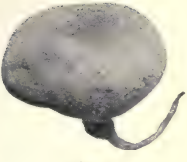


Fig. 5.

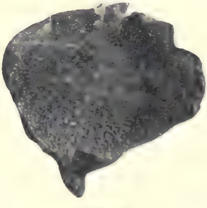


Fig. 6.

Explanation of Figures.

Fig. 1, Cortex enlarged. Fig. 2, Rimulose cortex enlarged. Figs. 3 and 5, From A. P. Morgan, Ohio. Figs. 4 and 6, From A. S. Bertolet, Canada.

LYCOPERDON RIMULATUM.

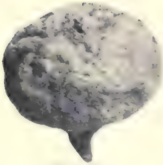


Fig. 7.

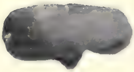


Fig. 8.

Fig. 9.

Explanation of Figures.

Fig. 7, From W. H. Long, Jr., Texas. Fig. 8, From A. P. Morgan, Ohio. Fig. 9, From A. S. Bertolet, Canada.

LYCOPERDON RIMULATUM.

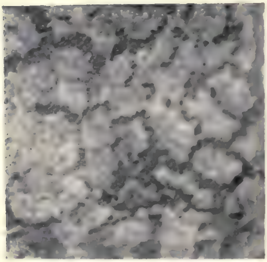


Fig. 10.

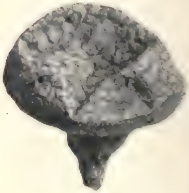


Fig. 11.

Explanation of Figures.

Fig. 10, Cortex enlarged. Fig. 11, Plant from C. H. Baker, Florida.

LYCOPERDON SUBVELATUM.

Issued by C. G. LLOYD.

PLATE 57.

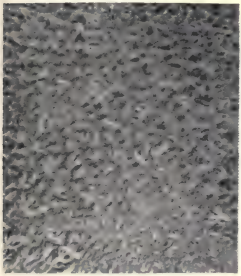


Fig. 1.

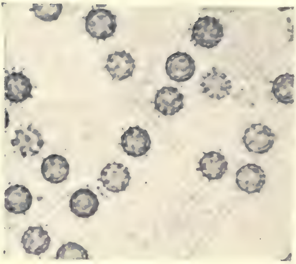


Fig. 2.

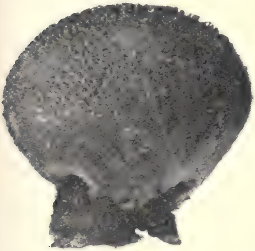


Fig. 3.

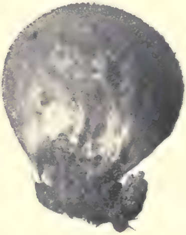


Fig. 4.

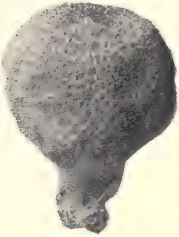


Fig. 5.

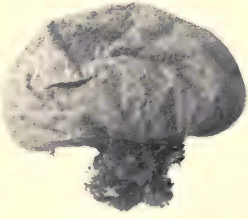


Fig. 6.

Explanation of Figures.

Fig. 1, Cortex enlarged. Fig. 2, Spores (X1000) microphotograph by Prof. E. W. D. Holway. Figs. 3 and 4, Specimens from A. P. Morgan, Ohio. Fig. 5, Rev. C. Torrend, Portugal. Fig. 6, L. Romell, Sweden.

LYCOPERDON ATROPURPUREUM.

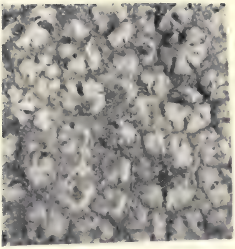


Fig. 7.

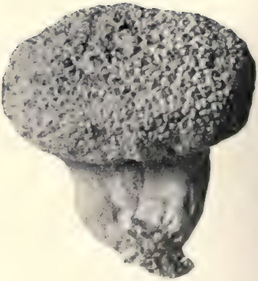


Fig. 8.

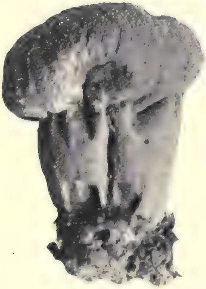


Fig. 9.

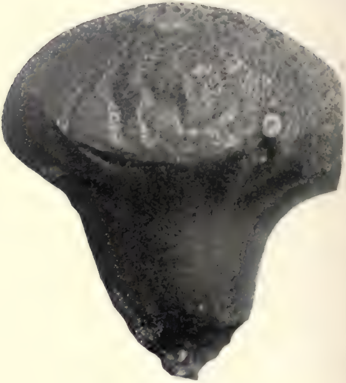


Fig. 10.

Explanation of Figures.

Fig. 7, Cortex enlarged. Fig. 8, From C. E. Brown, Wisconsin. Fig. 9, R. H. Denniston, Wisconsin. Fig. 10, A. P. Morgan, Ohio.

LYCOPERDON STELLARE.

PLATE 58.

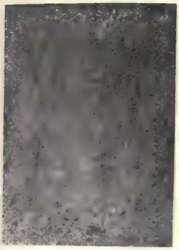


Fig. 1.

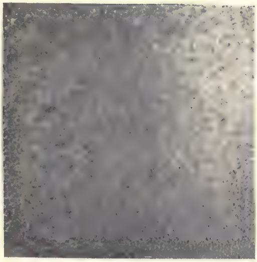


Fig. 2.

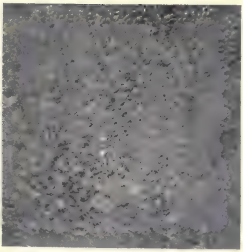


Fig. 3.

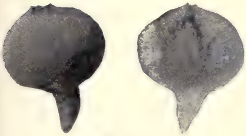


Fig. 4.

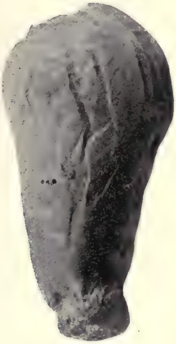


Fig. 5.

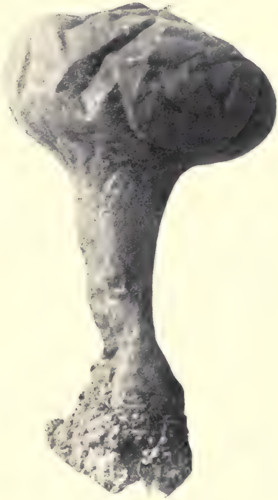


Fig. 6.

Explanation of Figures.

Figs. 1, 2, and 3, Cortices enlarged. Figs. 4 and 5, From R. H. Denniston Wisconsin. Fig. 6, H. C. Beardslee, North Carolina.

LYCOPERDON UMBRINUM.

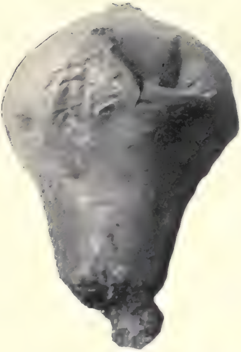


Fig. 7.

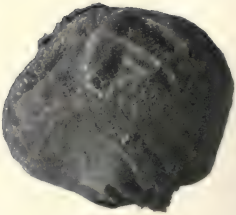


Fig. 8.

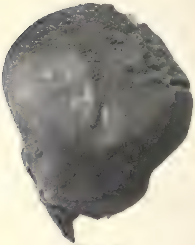


Fig. 9.

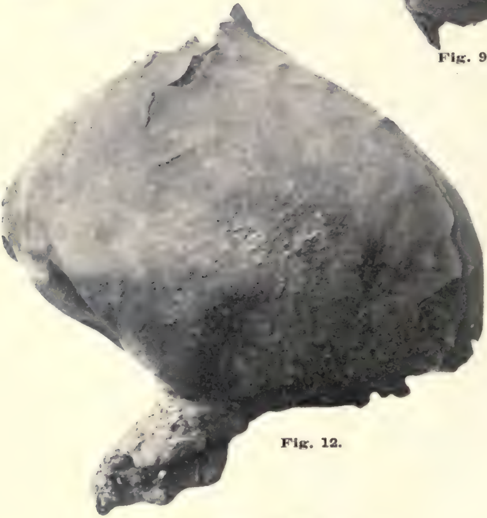


Fig. 12.

Explanation of Figures.

Fig. 7, From R. H. Denniston, Wisconsin. Fig. 8, Rev. C. Torrend, Portugal. Fig. 9, Dr. Wm. Herbst, Pennsylvania. Fig. 10, Type of Lycoperdon elegans in herbarium of A. P. Morgan.

LYCOPERDON UMBRINUM.

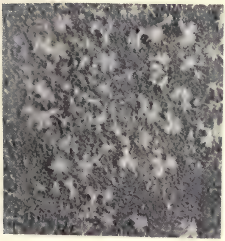


Fig. 1.

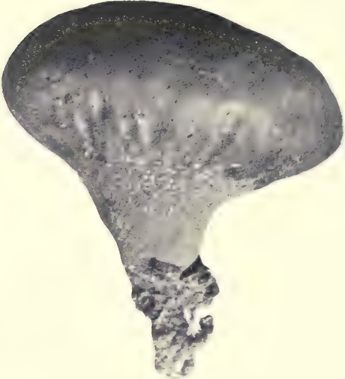


Fig. 2.

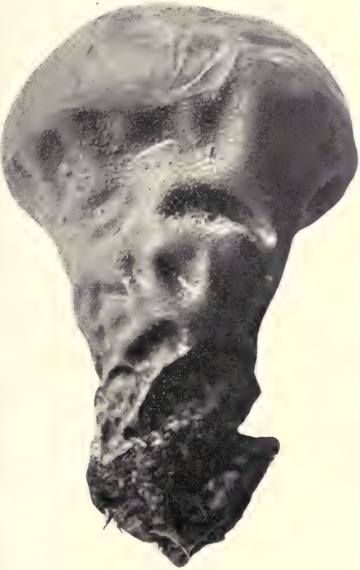


Fig. 3.

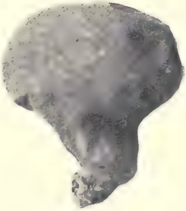


Fig. 4.

Explanation of Figures.

Fig. 1, Cortex enlarged. Fig. 2, From C. G. Lloyd, Kentucky. Fig. 3, A. P. Morgan, Ohio. Fig. 4, P. L. Ricker, Maine.

LYCOPERDON FLOCCOSUM.

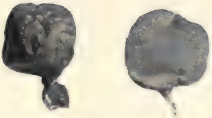
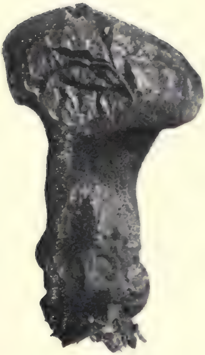


Fig. 5.

Explanation of Figure.

Fig. 5, Type specimens from A. P. Morgan.

LYCOPERDON DRYINUM.



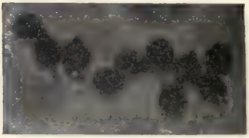


Fig. 7.

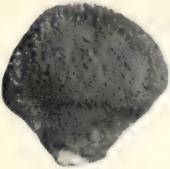


Fig. 6.

Fig. 8.

Explanation of Figures.

Figs. 6 and 8, Type specimens from A. P. Morgan, collected by Underwood in Alabama. Fig. 7, Spores (X1000).

LYCOPERDON EXIMIUM.

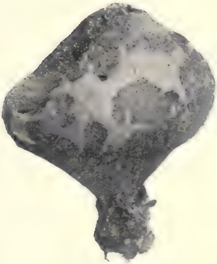


Fig. 1.

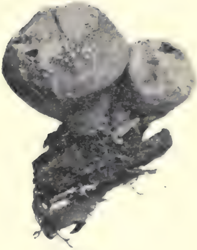


Fig. 2.

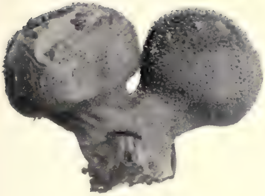


Fig. 3.

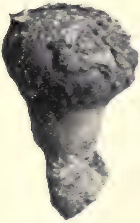


Fig. 4.

Explanation of Figures.

Figs. 1 and 3, From Theo. L. Smith, New Hampshire. Fig. 2, F. K. Vreeland, Maine. Fig. 4, Miss E. Hodges, Pennsylvania.

LYCOPERDON EXCORIATUM.

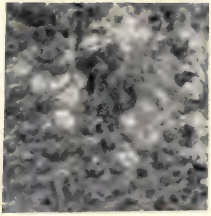


Fig. 1.

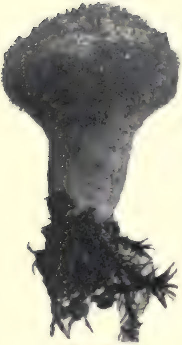


Fig. 2.

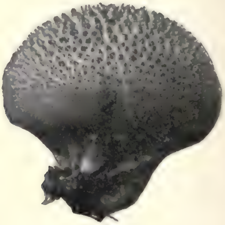


Fig. 3.

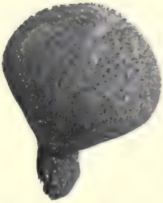


Fig. 4.

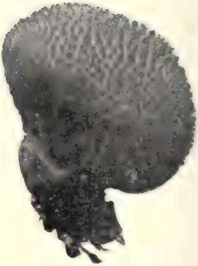


Fig. 5.

Explanation of Figures.

Fig. 1, Cortex enlarged. Photographs by C. G. Lloyd, in Sweden.

LYCOPERDON NIGRESCENS.

PLATE 61.

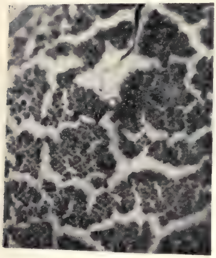


Fig. 1.

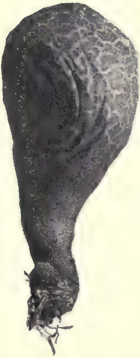


Fig. 2.

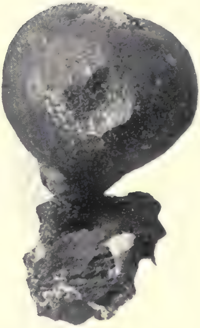


Fig. 3.

Explanation of Figures.

Fig. 1, Cortex enlarged. Fig. 2, From L. Romell, Sweden. Fig. 3, C. S. Conklin, New York.

LYCOPERDON SEROTINUM.

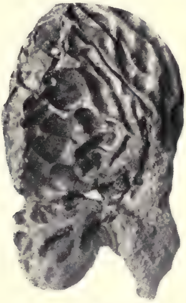


Fig. 4.

Explanation of Figure.

Fig. 4, From B. O. Longyear, Michigan.

LYCOPERDON FAVEOLUM.

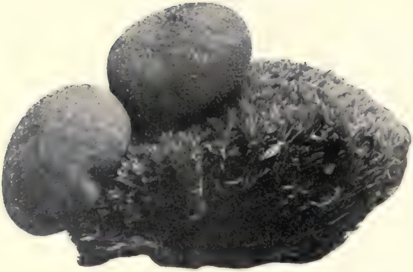


Fig. 1.

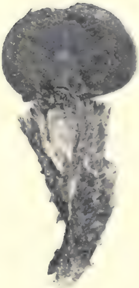


Fig. 2.

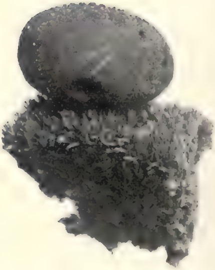


Fig. 3.

Explanation of Figures.

Plants from F. J. Braendle, Washington, D. C.

LYCOPERDON PSEUDORADICANS.

PLATE 62.

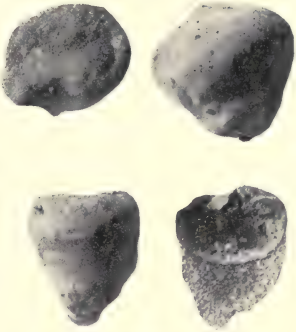


Fig. 1.

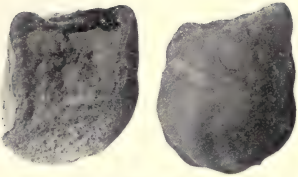


Fig. 2.

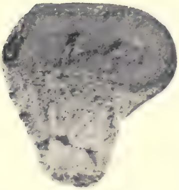


Fig. 3.

Explanation of Figures.

Figs. 1 and 3, From R. B. Mackintosh, Massachusetts. Fig. 2, From W. N. Suksdorf, Washington.

LYCOPERDON SUBPRATENSE.

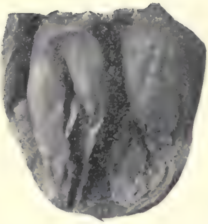


Fig. 4.

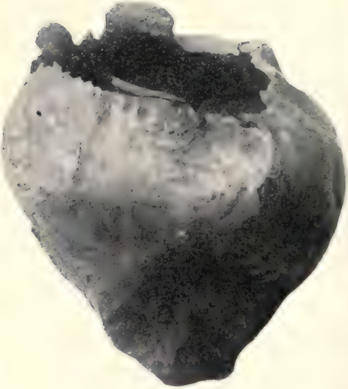


Fig. 5.

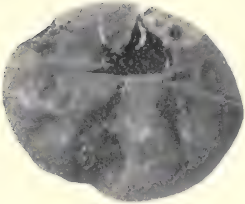


Fig. 6.

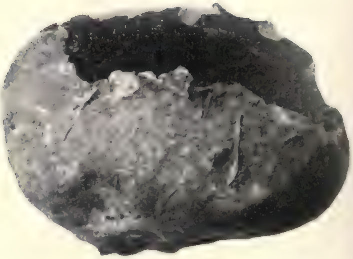


Fig. 7.

Explanation of Figures.

Fig. 4, From Clara A. Hunt, California. Figs. 5 and 7, C. V. Piper, Washington. Fig. 6, Jos. W. Marsh, Oregon.

LYCOPERDON SUBPRATENSE. (?)

Issued by C. G. LLOYD.

PLATE 63.

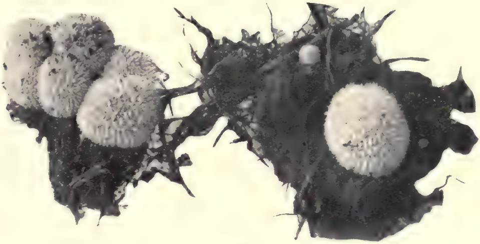


Fig. 1.

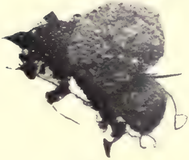


Fig. 2.

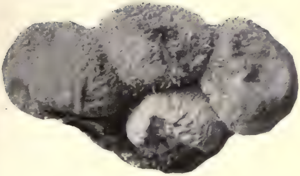


Fig. 3.

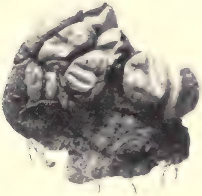


Fig. 4.

Explanation of Figures.

Fig. 1, From fresh specimens, C. G. Lloyd. Fig. 2, Same, cortex flaking off. Fig. 3, From C. W. Dawson, Ohio, with cortex gone. Fig. 4, R. B. Mackintosh, Massachusetts, unusually large plants.

LYCOPERDON WRIGHTII.

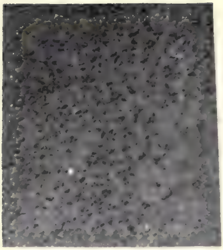


Fig. 5.

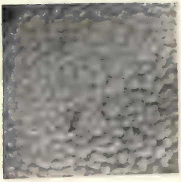


Fig. 6.

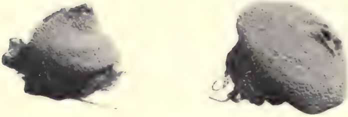


Fig. 7.

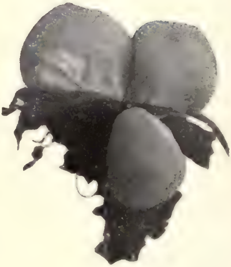


Fig. 8.

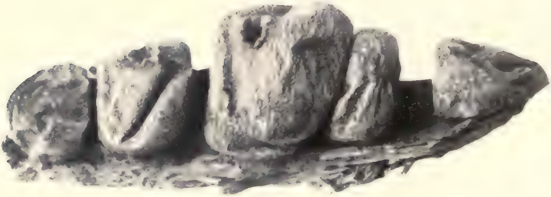


Fig. 9.

Explanation of Figures.

Fig. 5, Cortex enlarged. Fig. 6, Denuded surface of peridium, enlarged. Fig. 7, From Hugo Bilgram, Philadelphia. Eig. 8, Fresh specimens by C. G. Lloyd. Fig. 9, From T. L. Smith, New Hampshire.

LYCOPERDON SUBINCARNATUM.

PLATE 64.

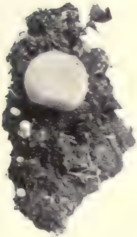


Fig. 1.

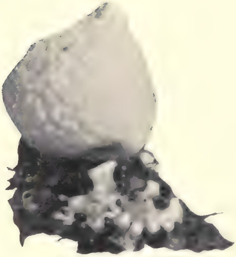


Fig. 2.

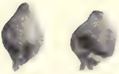


Fig. 3.

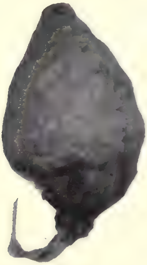


Fig. 4.

Explanation of Figures.

Fig. 1, From F. J. Braendle, Washington, D. C. Fig. 2, Same enlarged four diameters. Fig. 3, A. P. Morgan, Ohio. Fig. 4, Same enlarged four diameters.

LYCOPERDON ACUMINATUM.

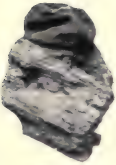


Fig. 5.

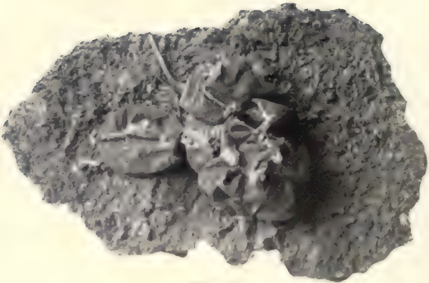


Fig. 6.

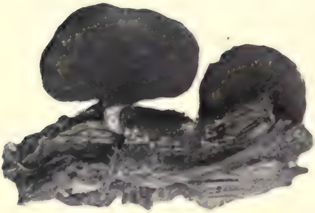


Fig. 7.

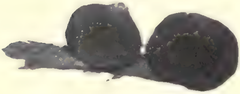


Fig. 8.

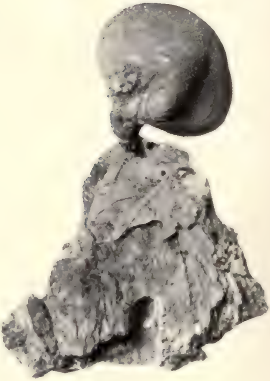


Fig. 9.

Explanation of Figures.

Fig. 5, From H. H. Hume, Florida. Figs. 6 and 9, Rev. J. Rick, Brazil (both same collection). Fig. 7, Specimen from Venezuela in Museum at Berlin. Fig. 8, Specimens from Brazil in Museum at Berlin.

LYCOPERDON FULIGINEUM.

PLATE 65.

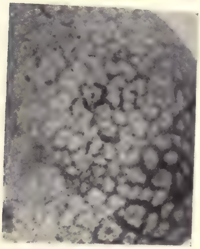


Fig. 1.

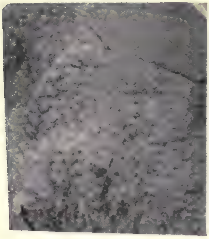


Fig. 2.

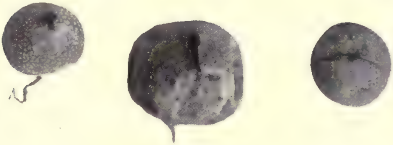


Fig. 3.

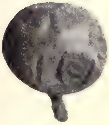


Fig. 4.

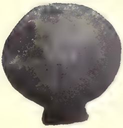


Fig. 5.

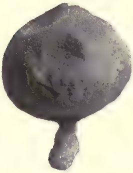


Fig. 6.

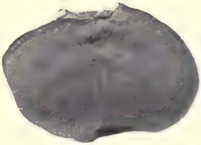


Fig. 7.

Explanation of Figures.

Fig. 1, Smooth cortex enlarged. Fig. 2, Same broken. Fig. 3, From fresh specimens, Cincinnati. Figs. 4, 5, and 6, Hollis Webster, Massachusetts. Fig. 7, L. R. Waldron, Michigan.

LYCOPERDON CEPAEFORME.

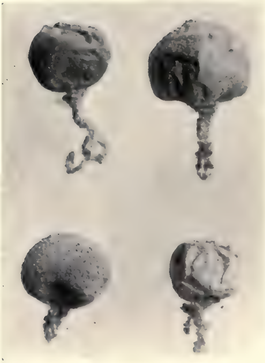


Fig. 8.

Explanation of Figure.

Fig. 8, From M. Bezzi, Italy.

LYCOPERDON PUSILLUM.

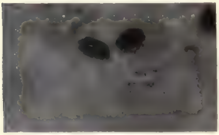


Fig. 9.

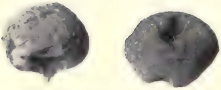


Fig. 10

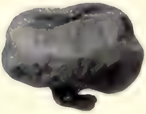


Fig. 11.

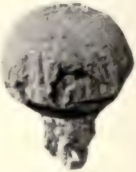


Fig. 12

Explanation of Figures.

Fig. 9, Spores (X1000) from type at Kew. Fig. 10, From Dr. N. M. Glatfelter, St. Louis, Mo. Figs. 11 and 12, From L. Damazio, Brazil.

LYCOPERDON OBLONGISPORUM.

Fig. 1.

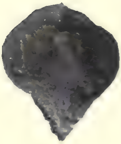


Fig. 2.

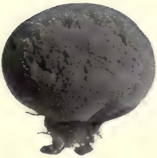


Fig. 3.

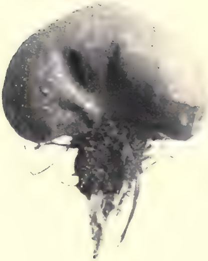


Fig. 4.

Explanation of Figures.

Figs. 1 and 2, Type specimens from J. B. Ellis in herbarium, A. P. Morgan. Figs. 3 and 4, F. K. Vreeland, Maine.

LYCOPERDON TURNERI.

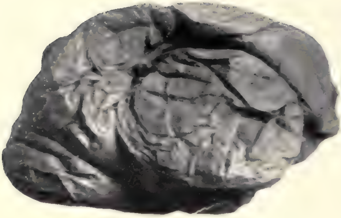


Fig. 5.

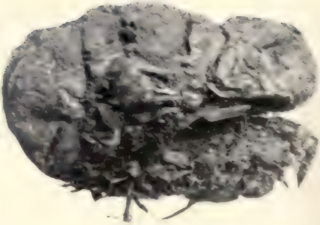


Fig. 6.

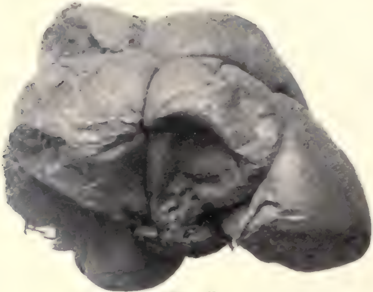


Fig. 7.

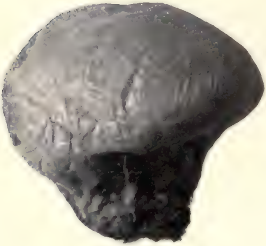


Fig. 8.

Explanation of Figures.

Fig. 5, From W. C. Dawson, Ohio. Fig. 6, From E. P. Ely, Minnesota. Figs. 7 and 8, From C. G. Lloyd, West Virginia.

LYCOPERDON COMPRESSUM.

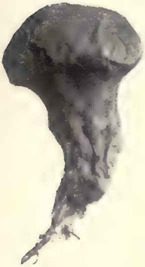


Fig. 1.

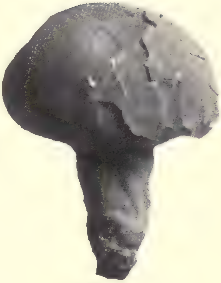


Fig. 2.

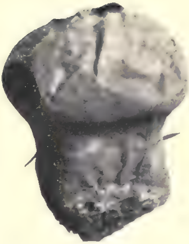


Fig. 3.

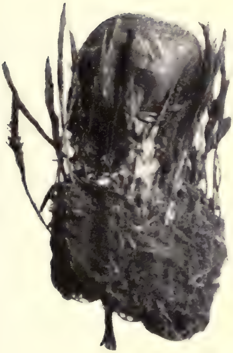


Fig. 4.

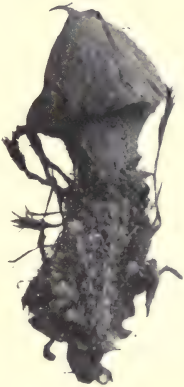


Fig. 5.

Explanation of Figures.

Figs. 1 and 2, From Chas. Peck, New York. Fig. 3, Simon Davis, Massachusetts. Figs. 4 and 5, From C. S. Conkling, New York.

LYCOPERDON MUSCORUM.

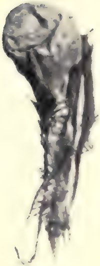


Fig. 6.

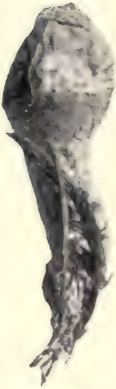


Fig. 7.

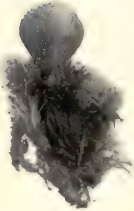


Fig. 8.

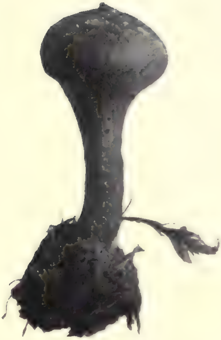


Fig. 9.

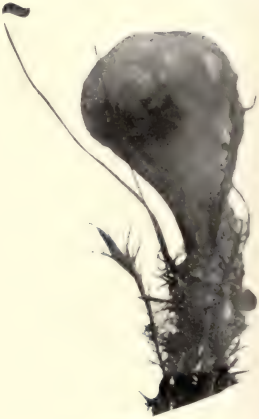


Fig. 10

Explanation of Figures.

Fig. 6, From Chas. Peck, New York. Fig. 7, H. C. Beardslee, Maine. Figs. 8, 9, and 10, C. G. Lloyd, West Virginia.

LYCOPERDON POLYTRICHUM.

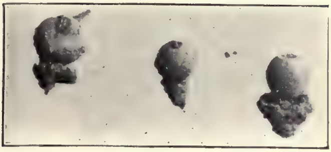


Fig. 1.

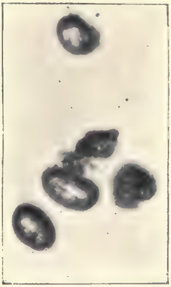


Fig. 2.

Explanation of Figures.

Fig. 1, Type specimens from F. J. Tyler, Virginia. Fig. 2, Spores (X1000.)

MITREMYCES TYLERII.

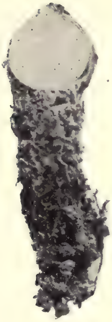


Fig. 3.

Fig. 4.

Explanation of Figures.

Fig. 3, From C. L. Shear, Washington, D. C. Fig. 4, F. J. Braendle, Washington, D. C.

MITREMYCES RAVENELII.

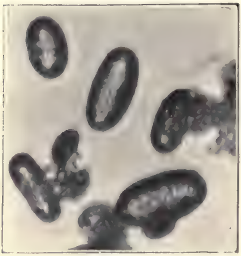


Fig. 5.

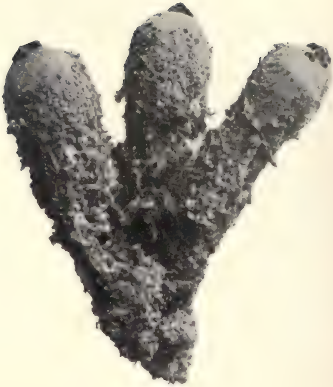


Fig. 6.

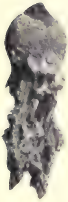


Fig. 7.

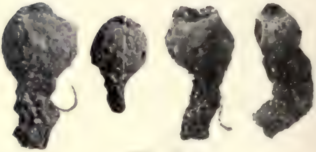


Fig. 8.

Explanation of Figures.

Fig. 5, Spores (X1000.) Fig. 6, From F. J. Braendle, Washington, D. C. Fig. 7, C. L. Shear, Washington, D. C. Fig. 8, T. Yoshinga, Japan.

MITREMYCES RAVENELII.

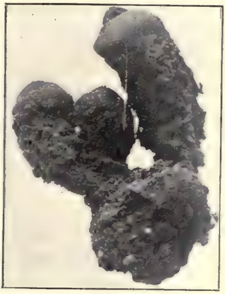


Fig. 1.

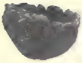


Fig. 2.

Explanation of Figures.

Type specimens at Kew.

MITREMYCES FUSCUS.

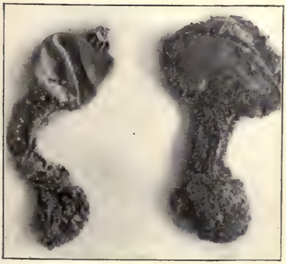


Fig. 3.

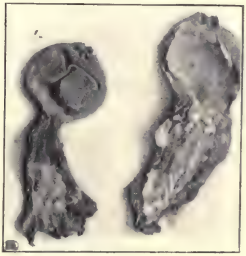


Fig. 4.

Explanation of Figures.

Type specimens at Kew.

MITREMYCES INSIGNIS.

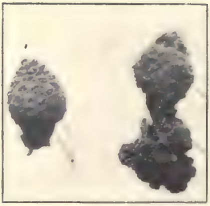


Fig. 5.

Explanation of Figure.

Type specimens at Kew.

MITREMYCES ORIRUBRA.

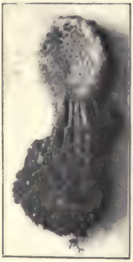


Fig. 6.

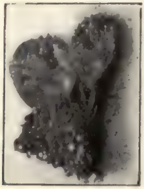


Fig. 7.

Explanation of Figures.

Specimens from India and East Indies at Kew.

MITREMYCES JUNGHUHNI.

PLATE 70.

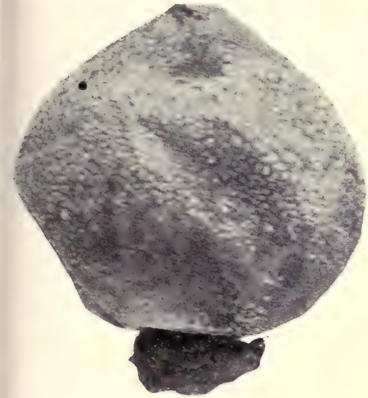


Fig. 1.

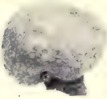


Fig. 2.

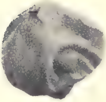


Fig. 3.

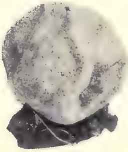


Fig. 4.

Fig. 1, enlarged. Figs. 2, 3, and 4, natural size. All from F. M. Reader, Australia.

BOVISTELLA BOVISTOIDES.

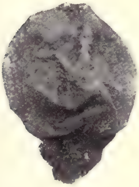


Fig. 5.

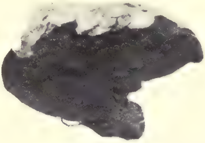


Fig. 6.

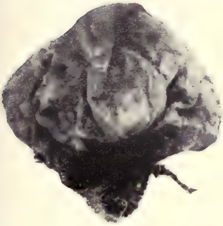


Fig. 7.

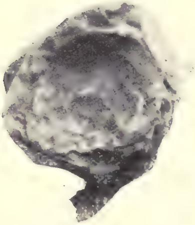


Fig. 8.

Specimens from Professor D. McAlpine, Melbourne.

BOVISTELLA GUNNII.

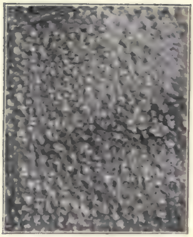


Fig. 9.

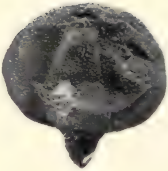


Fig. 10

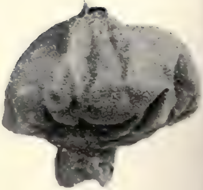


Fig. 11.

Fig. 9, cortex enlarged. Fig. 10, specimen from J. T. Paul, Australia. Fig. 11, specimen from J. G. O. Tepper, Australia.

BOVISTELLA SCABRA.

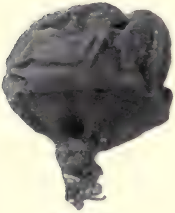


Fig. 12

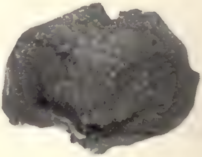


Fig. 13.

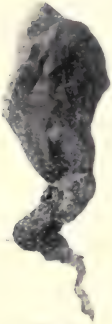


Fig. 14.

Fig. 15.

Specimens from J. T. Paul, Australia.

BOVISTELLA AUSTRALIANA.

Issued by C. G. LLOYD.

PLATE 71.

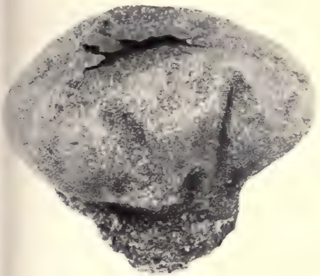


Fig. 1.

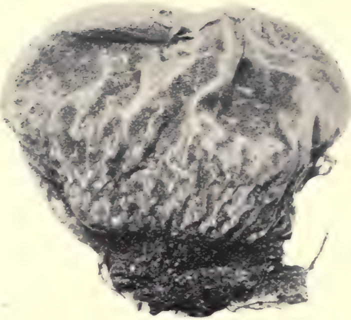


Fig. 2.

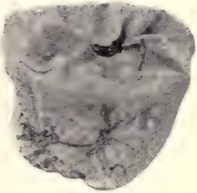


Fig. 3.

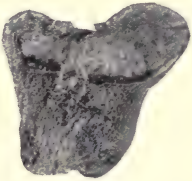


Fig. 4.

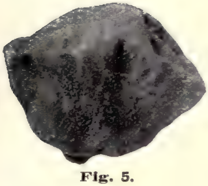


Fig. 5.

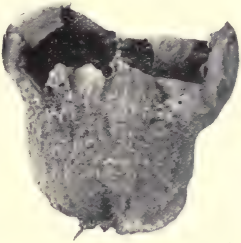


Fig. 6.

Figs. 1 and 2, specimens from Professor D. McAlpine, Melbourne. Figs. 3, 4, 5, nd 6, from Robert Brown, New Zealand.

LYCOPERDON PRATENSE.

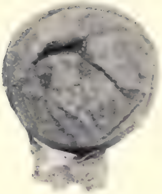


Fig. 7.

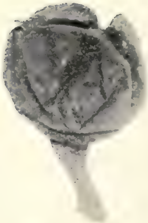


Fig. 8.

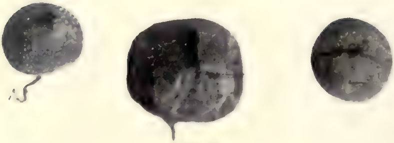


Fig. 9.

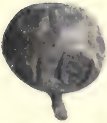


Fig. 10

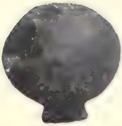


Fig. 11.

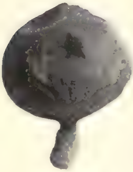


Fig. 12

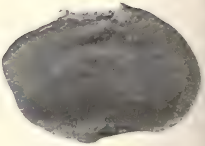


Fig. 13.

Figs. 7 and 8, specimens from F. M. Reader, Australia. Fig. 9, from fresh specimens, Cincinnati. Figs. 10, 11, and 12, from Hollis Webster, Massachusetts. Fig. 13, from L. R. Waldron, Michigan.

LYCOPERDON CEPAEFORME.

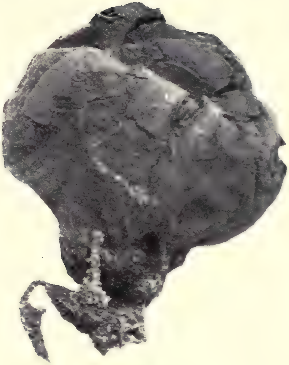


Fig. 1.

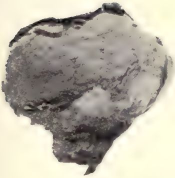


Fig. 2.

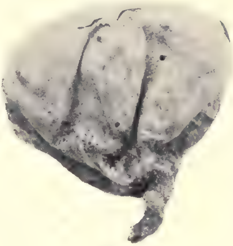


Fig. 3.

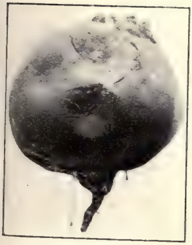


Fig. 4.

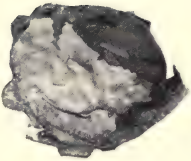


Fig. 5.

Figs. 1, 2, and 3, specimens from Professor D. McAlpine, Melbourne. Fig. 4, from J. G. O. Tepper, Australia. Fig. 5, from Dr. Hollós, Hungary.

CALVATIA CANDIDA.

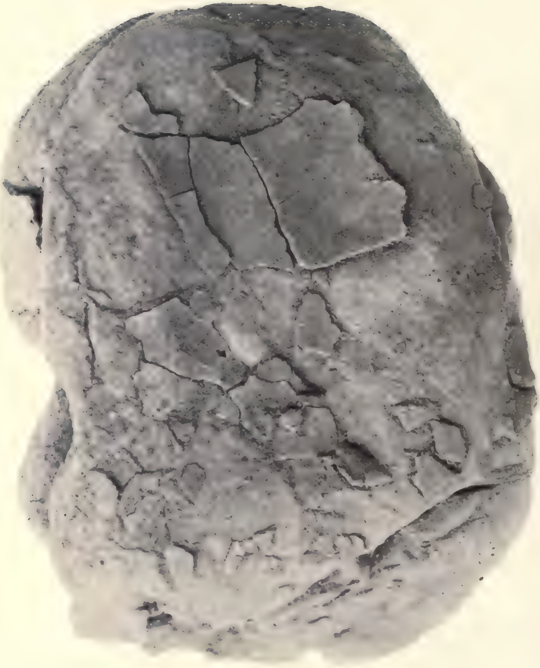


Fig. 6.

Specimen from Professor D. McAlpine, collected by F. M. Reader at Dimboola, Australia.

CALVATIA OLIVACEA.

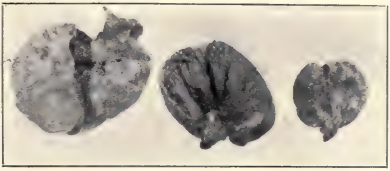


Fig. 1.

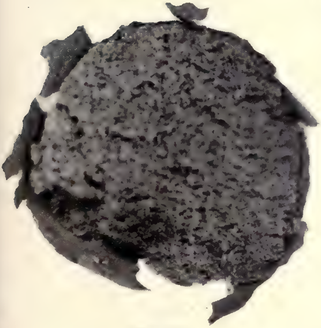


Fig. 2.

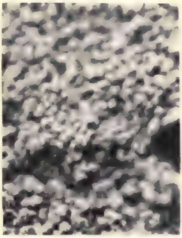


Fig. 3.

Fig. 1, specimens from Rev. L. Badet, Italy. Fig. 2, section enlarged. Fig. 3, gleba enlarged × 10.

ARACHNION ALBUM.

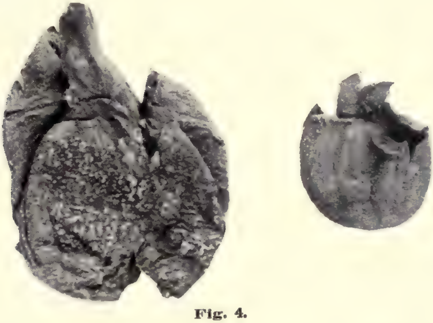


Fig. 4.

Specimens from Professor D. McAlpine, Australia.

ARACHNION RUFUM.

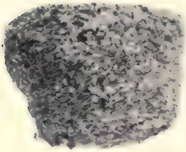


Fig. 5.

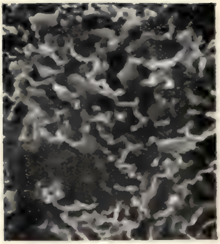


Fig. 6.

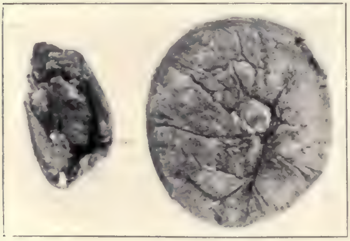


Fig. 7.

Fig. 5, gleba enlarged. Fig. 6, gleba enlarged × 10. Fig. 7, specimens from T. S. Brandegee, Mexico.

HOLOCOTYLON BRANDEGEEANUM.

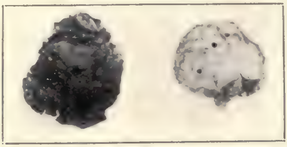


Fig. 8.

Specimens from J. W. Stiles, Texas.

HOLOCOTYLON TEXENSE.

plates missing, 74-85

Issued by C. G. LLOYD.

PLATE 86.

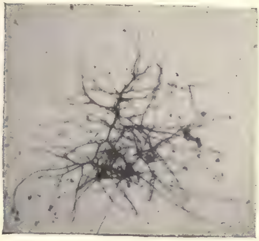


Fig. 1.

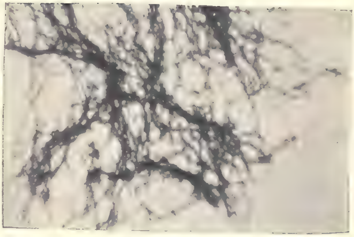


Fig. 2.

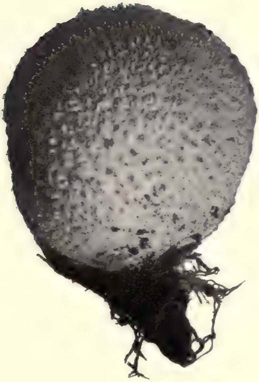


Fig. 3.

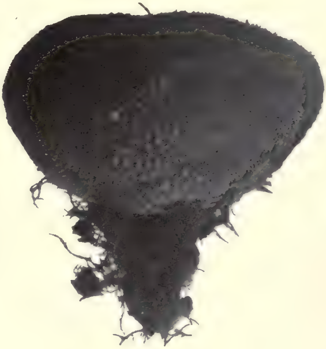


Fig. 4.

Fig. 1, a separate thread of capillitium (x 100). Fig. 2, tissue of sterile base (x 100). Fig. 3, a fresh plant with cortex. Fig. 4, same cortex partially dried.

BOVISTELLA OHIENSIS.

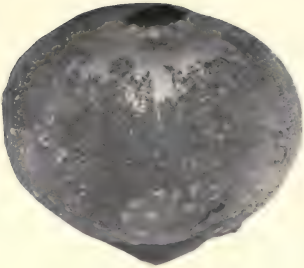


Fig. 5.

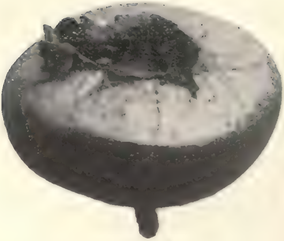


Fig. 6.

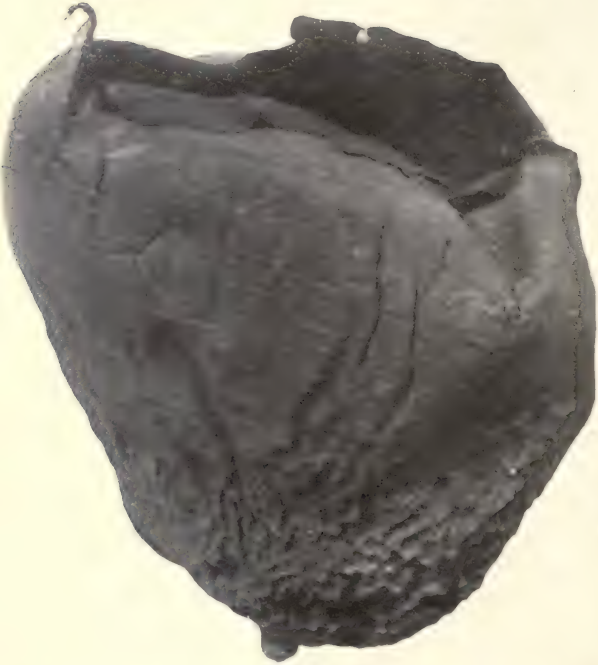


Fig. 7.

Fig. 5, specimens with cortex almost gone. Fig. 6, old specimens without cortex. Fig. 7, an unusual, robust specimen, collected by Gentry in Indiana and now in collection of New York Botanical Garden.

BOVISTELLA OHIENSIS.

PLATE 87.

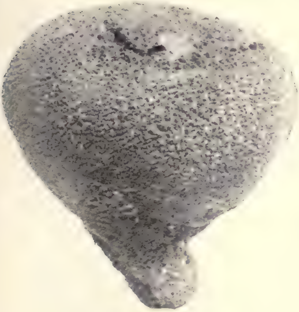


Fig. 1.

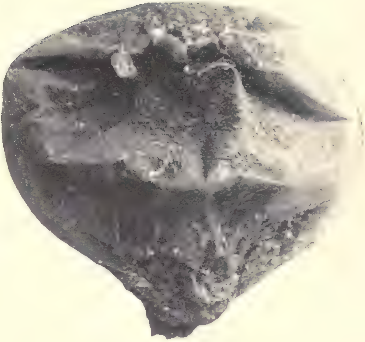


Fig. 2.

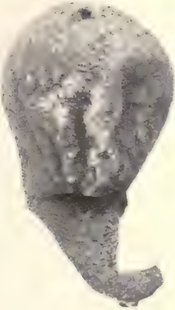


Fig. 3.

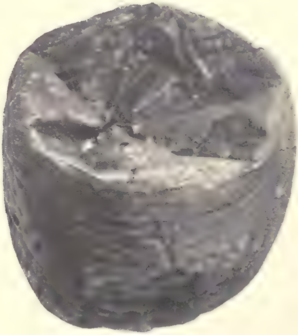


Fig. 4.

Figs. 1 and 2, specimens from Rev. P. Merino, Spain. Figs. 3 and 4, from Professor Plöttner, Rathenow, Germany.

BOVISTELLA RADICATA.

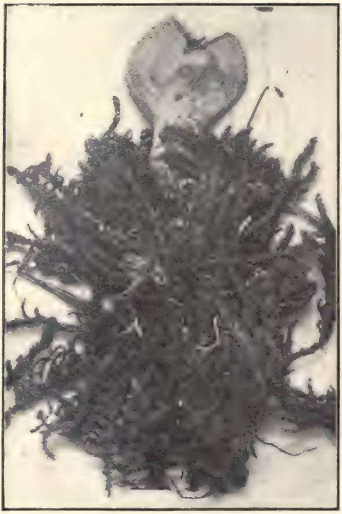


Fig. 5.

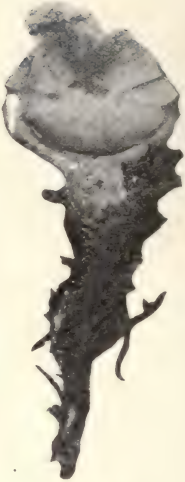


Fig. 6.

Type specimens at Kew.

BOVISTELLA LYCOPERDOIDES.

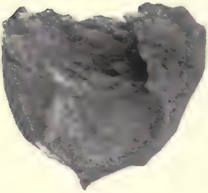


Fig. 7.

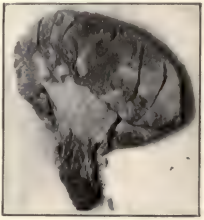


Fig. 8.

Fig. 7, type specimen, museum at Paris.

Fig. 8, type specimen at Kew.

BOVISTELLA AMMOPHILA.

BOVISTELLA PALUDOSA.

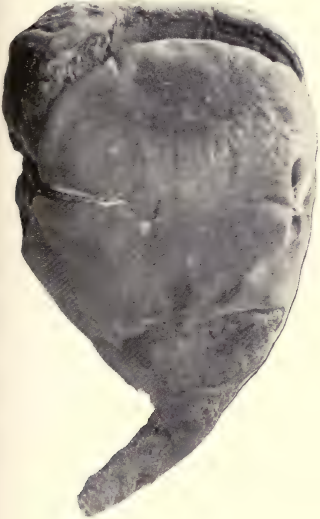


Fig. 1.

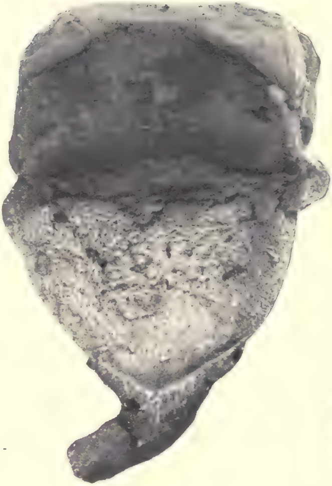


Fig. 2.

Fig. 1, plant from Kingo Miyabe, Sapporo, Japan. Fig. 2, section of same.

BOVISTELLA JAPONICA.

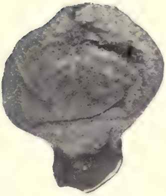


Fig. 3.

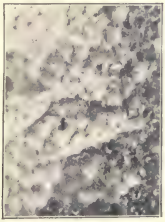


Fig. 4.

Fig. 3, plant from Kingo Miyabe, Sapporo, Japan. Fig. 4, denuded cortex (enlarged).

BOVISTELLA MIYABEI.

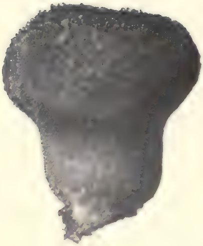


Fig. 5.

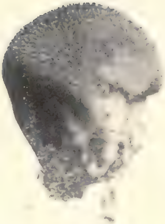


Fig. 6.

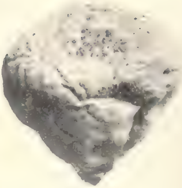


Fig. 7.

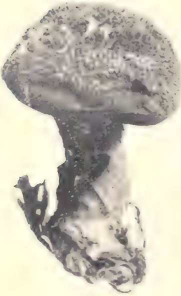


Fig. 8.

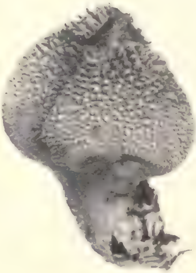


Fig. 9.

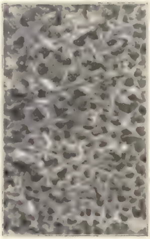


Fig. 10

Fig. 5. type specimen from Professor Peck. Fig. 6, specimen from G. E. Morris, Massachusetts. Fig. 7, another from Mr. Morris, with cortex almost gone. Figs. 8 and 9, from Professor Plöttner, Germany. Fig. 10, cortex enlarged.

BOVISTELLA PEDICELLATA.

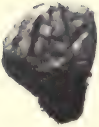


Fig. 11.

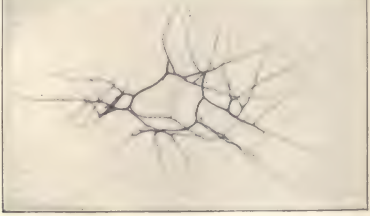


Fig. 12

Fig. 11, plant from W. N. Suksdorf, Washington. Fig. 12, capillitium (x 100).

BOVISTELLA DEALBATA.

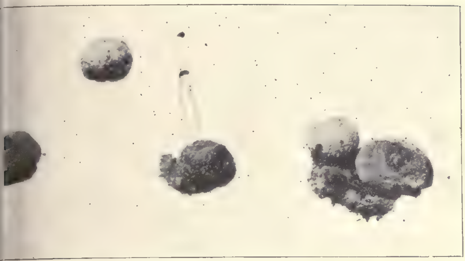


Fig. 1.

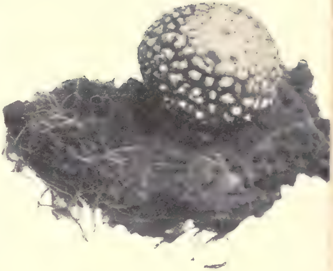


Fig. 2.

Fig. 1, plants from B. O. Longyear, Michigan. Fig. 2, a plant enlarged four diameters.

BOVISTELLA ECHINELLA.

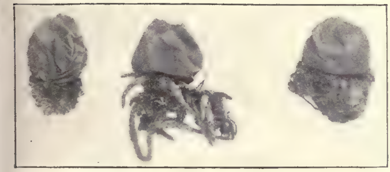


Fig. 3.

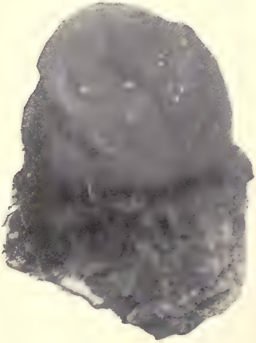


Fig. 4.

Fig. 3, plants from William Gollan, British India. Fig. 4, a plant enlarged four diameters.

BOVISTELLA TRACHYSPORA.

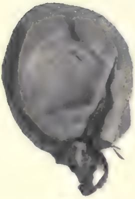


Fig. 5.

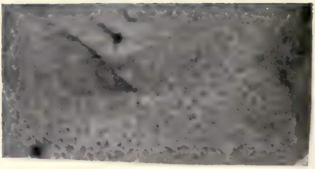


Fig. 6.

Fig. 5, plant from British India, given me by Dr. Hennings. Fig. 6, cortex enlarged.

BOVISTELLA HENNINGSII.

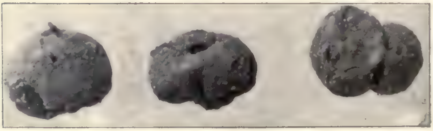


Fig. 7.

Fig. 7, plants from Simon Davis, Massachusetts.

BOVISTELLA DAVISII.

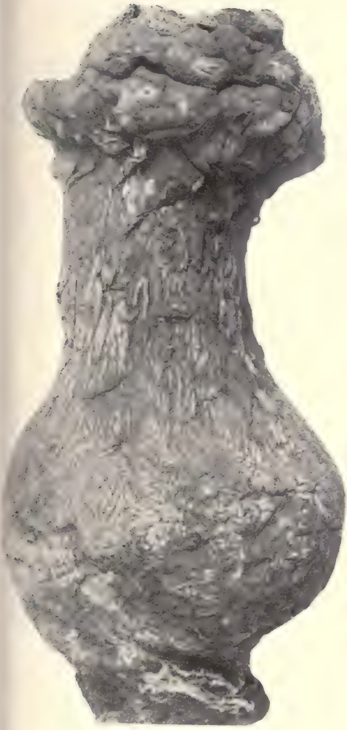


Fig. 1.

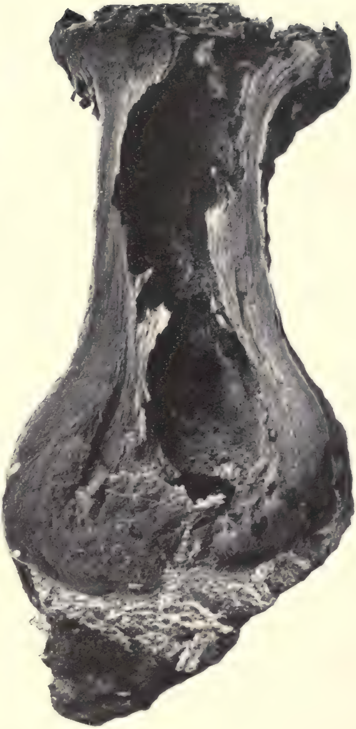


Fig. 2.

Figs. 1 and 2, plant and section from type specimen from Dr. Mary S. Whetstone, Minnesota.

WHETSTONIA STROBILIFORMIS.

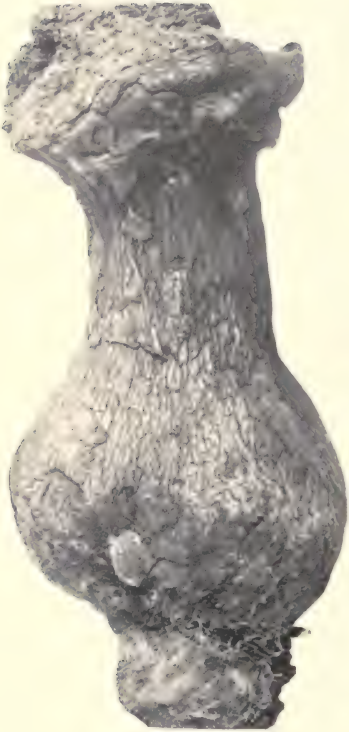


Fig. 3.

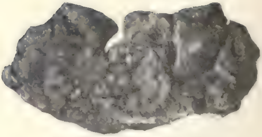


Fig. 4.

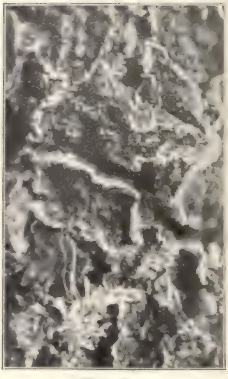


Fig. 5.

Fig. 3, type specimen from Dr. Mary S. Whetstone, Minnesota. Fig. 4, a piece of the peridium, exhibiting the manner in which it breaks. Fig. 5, gleba enlarged ten diameters, showing the gleba cells.

WHETSTONIA STROBILIFORMIS.

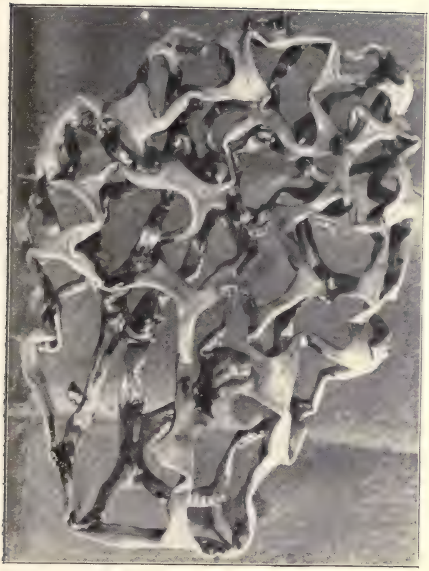


Fig. 1.

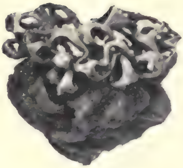


Fig. 3.

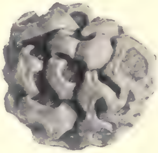


Fig. 4.

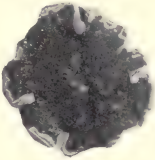


Fig. 5.

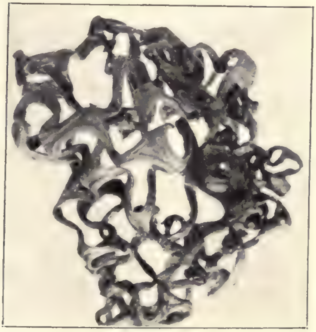


Fig. 2.

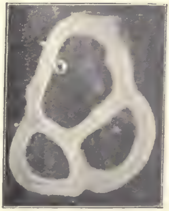


Fig. 6.

Figs. 1 and 2, alcoholic specimens devoid of volva. Fig. 3, same (small) with volva. Fig. 4, unexpanded specimen (deprived of volva). Fig. 5, section of same. Fig. 6, section of the receptacle enlarged (ten times). All from H. S. James and J. T. Paul, Australia.

CLATHRUS GRACILIS.

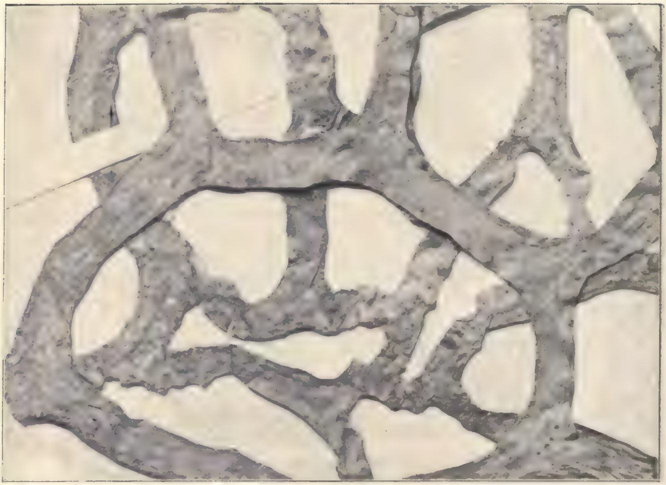


Fig. 7.

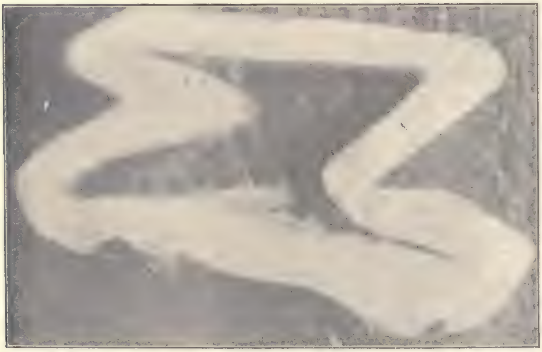


Fig. 8

Fig. 7, dried, pressed specimen at Kew. Fig. 8, section of the receptacle enlarged (ten times) from alcoholic (type) material at Paris.

CLATHRUS CIBARIUS.

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PLATE 92.

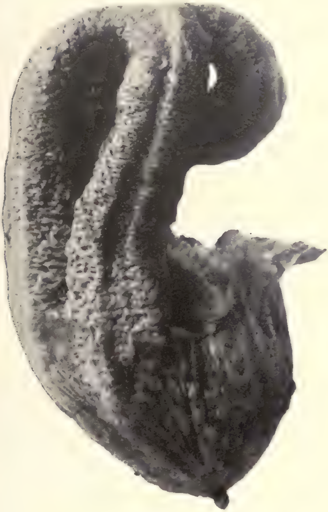

Fig. 1.

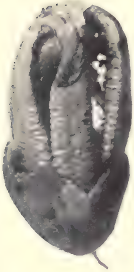

Fig. 2.

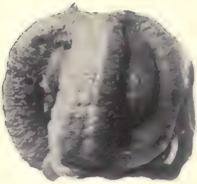

Fig. 3.

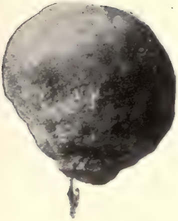

Fig. 4.

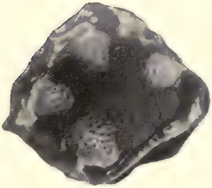

Fig. 5.

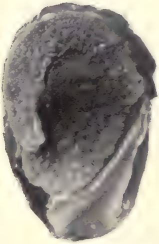

Fig. 6.

Fig. 1, plant natural size. Fig. 2, a small specimen. Fig. 3, a young specimen enclosing the gleba. Fig. 4, an egg. Fig. 5, cross section of an egg. Fig. 6, vertical section of an egg. All from specimens from C. E. Pleas, Florida.

LATERNEA COLUMNATA.

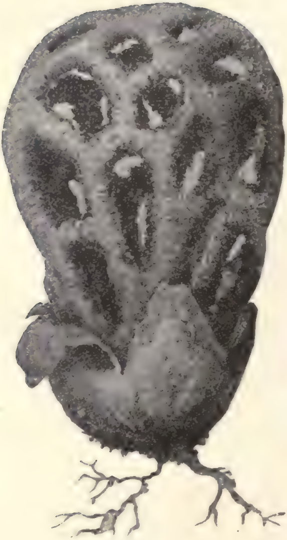

Fig. 7.

Copied from Engler and Prantl. Figure by Professor Ed. Fischer.

CLATHRUS CANCELLATUS.

PLATE 93.

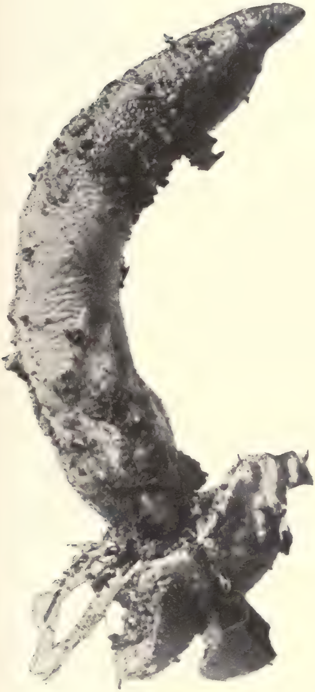

Fig. 1.

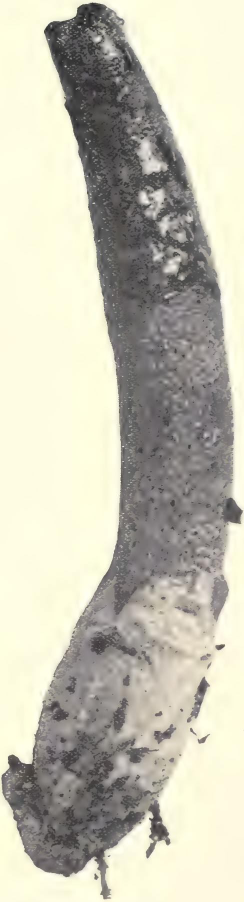

Fig. 2.

Figs. 1 and 2, specimens from Cincinnati (the top broken off the latter).

MUTINUS ELEGANS.

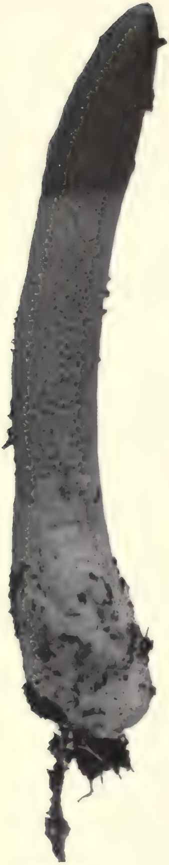

Fig. 3.

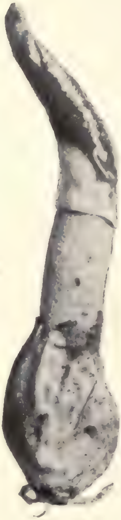

Fig. 4.

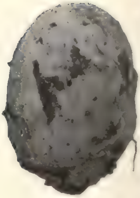

Fig. 5.

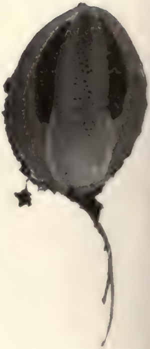

Fig. 6.

Fig. 3, plant from Eglon, W. Va. Fig. 4, photograph from H. C. Beardslee, Asheville, N. C. The specimen shows a remnant of the rudimentary veil adhering to the stipe. Fig. 5, an egg. Fig. 6, section of an egg.

MUTINUS ELEGANS.

PLATE 94.

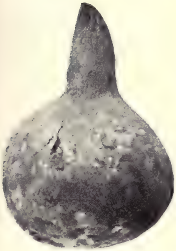

Fig. 1.

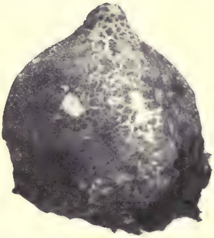

Fig. 2.

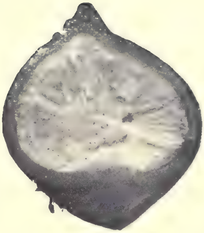

Fig. 3.

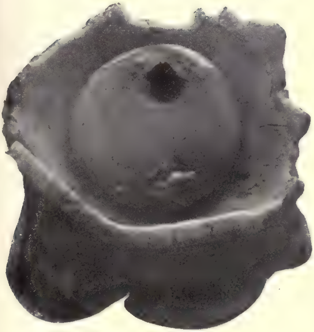

Fig. 4.

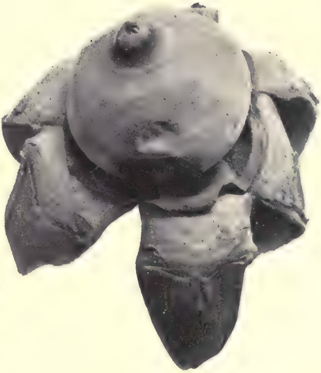

Fig. 5.

Figs. 1 and 2, small specimens, unexpanded. Fig. 3, section of same. Fig. 4, fresh plant photographed in Samoa. Fig. 5, specimen (dry) from A. P. Morgan, Ohio.

GEASTER TRIPLEX.

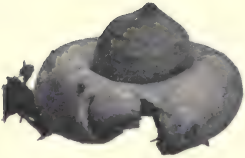

Fig. 6.

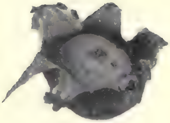

Fig. 7.

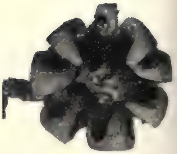

Fig. 8.

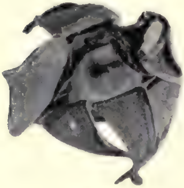

Fig. 9.

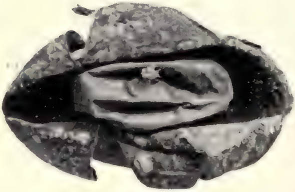

Fig. 10.

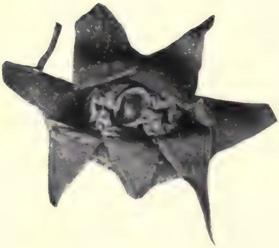

Fig. 11.

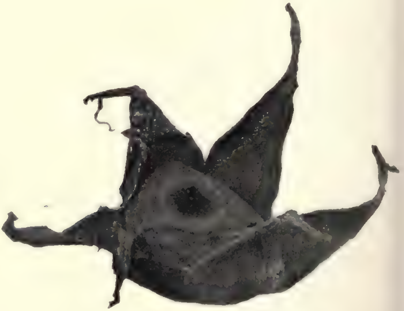

Fig. 12

Figs. 6, 7, and 8, fresh plants, the small typical form. Figs. 9 and 10, dried specimens from Australia. Fig. 11, from Europe. (This is a type of G. lageniformis.) Fig. 12, a large specimen, tending toward G. triplex.

GEASTER SACCATUS.

PLATE 95.

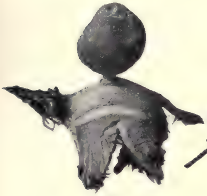

Fig. 1.

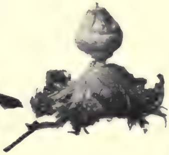

Fig. 2.

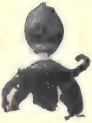

Fig. 3.

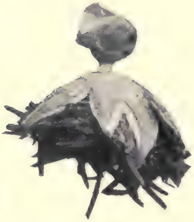

Fig. 4.

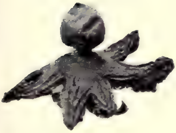

Fig. 5.

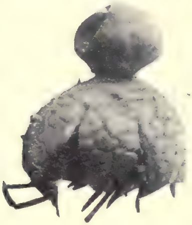

Fig. 6.

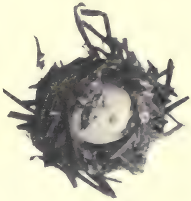

Fig. 7.

Figs. 1, 2, 3, and 4, dried specimens from the United States. Fig. 5, from J. G. O. Tepper, Australia. Figs. 6 and 7, fresh specimens, showing that it becomes "pedicellate" in drying.

GEASTER MINIMUS.

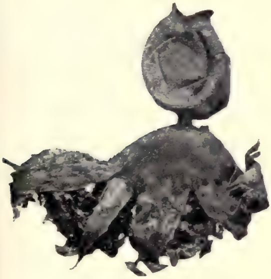

Fig. 8.

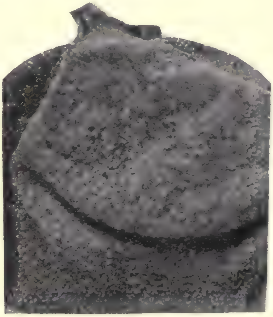

Fig. 9.

Fig. 8, specimen from South Africa from Professor Plöttner. Fig. 9, endoperidium enlarged to show the calcareous grains.

GEASTER CALCEUS.

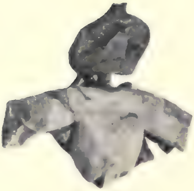

Fig. 10

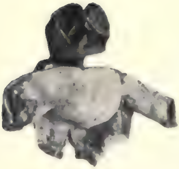

Fig. 11.

Figs. 10 and 11, from type specimens at Kew.

GEASTER PERUVIANUS.

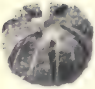

Fig. 12.

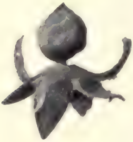

Fig. 13.

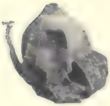

Fig. 14.

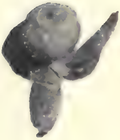

Fig. 15.

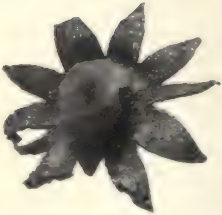

Fig. 16.

Figs. 12, 13, 14, 15, and 16, from type specimens, all collected in the sand at Jupiter, Florida.

GEASTER ARENARIUS.

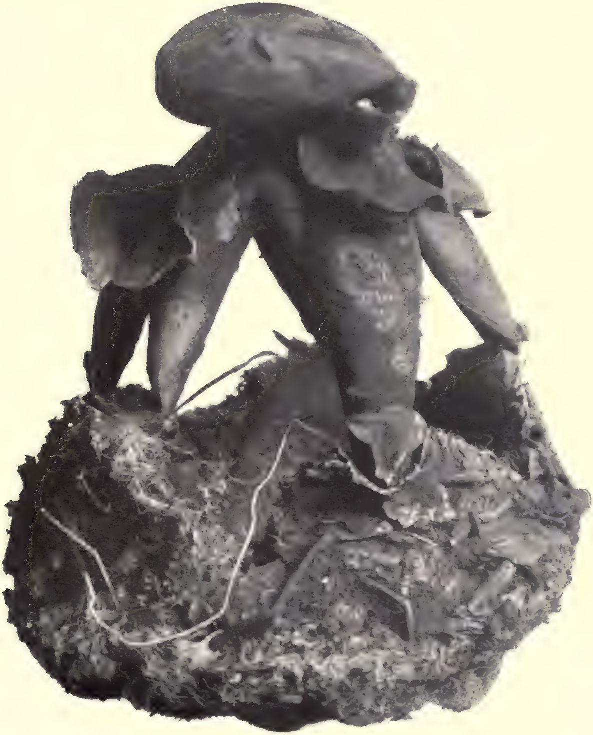

Fig. 1.

Fig. 1, a very large specimen, received from Carleton Rea, England.

GEASTER FORNICATUS.

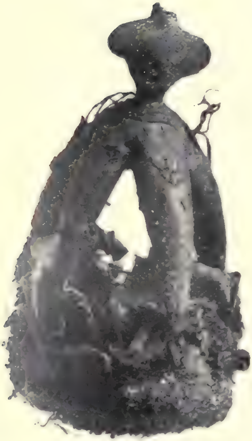

Fig. 2.

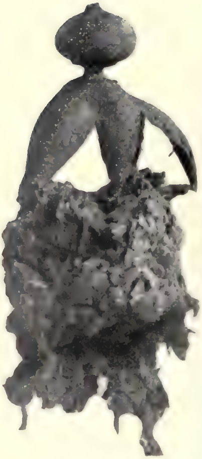

Fig. 3.

Fig. 2, from Dr. L. Hollós, Hungary. Fig. 3, from W. H. Long, Jr., Texas.

GEASTER FORNICATUS.

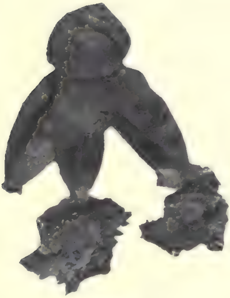

Fig. 4.

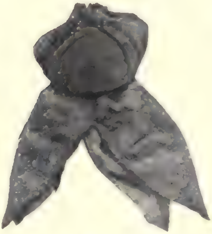

Fig. 5.

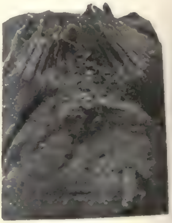

Fig. 6.

Figs. 4 and 5, from Professor Plöttner, from South Africa. Fig. 6, the mouth enlarged five times.

GEASTER MACOWANI.

PLATE 97.

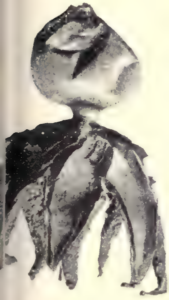

Fig. 1.

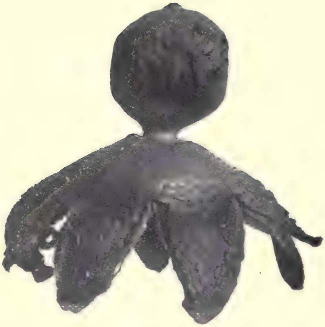

Fig. 2.

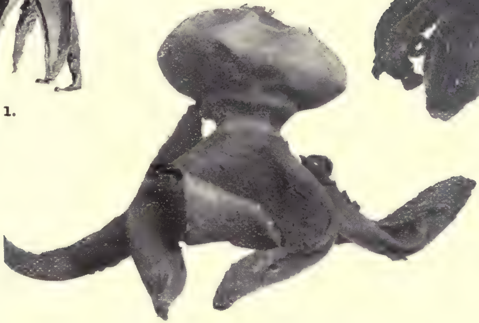

Fig. 3.

ig. 1, from F. LeRoy Sargent, Massachusetts. Fig. 2, from Dr. L. Hollós, Hungary. Fig. 3.
Professor T. H. McBride, Iowa.

GEASTER LIMBATUS.

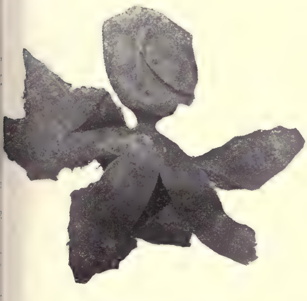

Fig. 4.

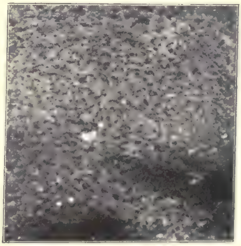

Fig. 5.

Fig. 4, type in Museum of Berlin. Fig. 5, endoperidium surface enlarged five times.

GEASTER HIERONYMII.

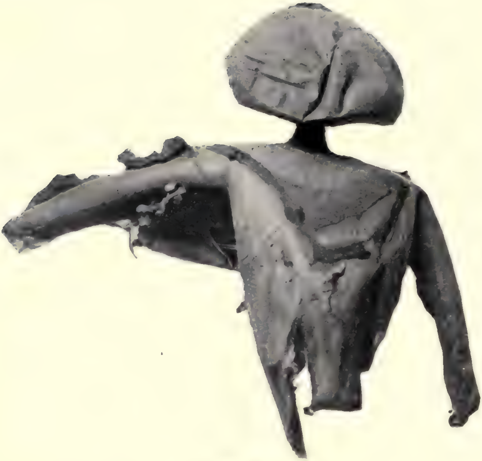

Fig. 6.

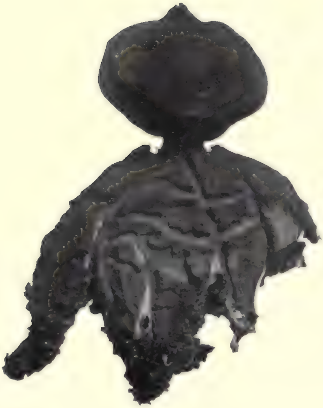

Fig. 7.

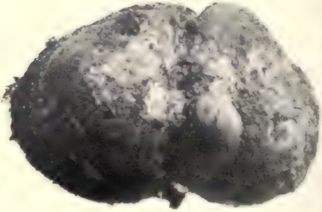

Fig. 8

Fig. 6, from Frank R. Rathbun, New York (Cfr. Myc. Notes, p. 144). Fig. 7, from A. P. Morgan, Ohio. Fig. 8, an unexpanded plant from Dr. H. L. True, Ohio.

GEASTER RUFESCENS.

PLATE 98.

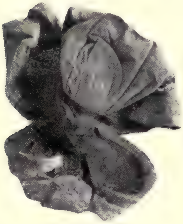

Fig. 1.

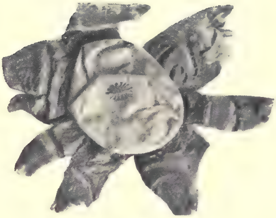

Fig. 2.

Figs. 1 and 2, type specimens in Montagne's Herbarium.

GEASTER AMBIGUUS.

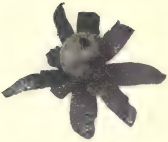

Fig. 3.

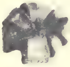

Fig. 4.

Figs. 3 and 4, specimens from Dr. L. Hollós.

GEASTER STRIATULUS.

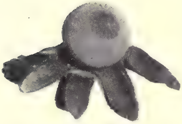

Fig. 5.

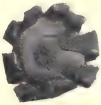

Fig. 6.

Figs. 5 and 6, type specimens at Kew.

GEASTER DRUMMONDII.

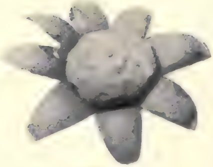
Fig. 7.

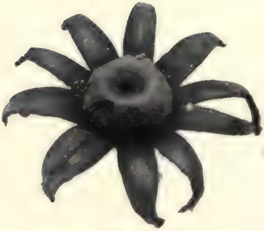
Fig. 8.

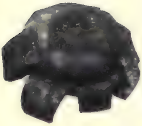
Fig. 9.

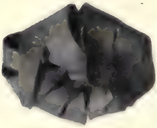
Fig. 10

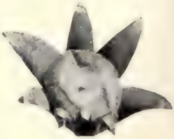
Fig. 11.

Figs. 7, 8, and 9, from Charles Crossland, England. Figs. 10 and 11, from J. Dearness, Canada.

GEASTER MAMMOSUS.

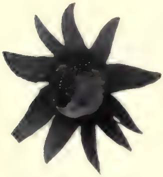
Fig. 12.

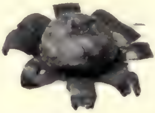
Fig. 13.

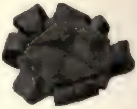
Fig. 14.

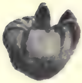
Fig. 15.

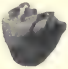
Fig. 16.

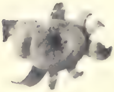
Fig. 17.

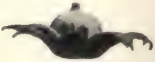
Fig. 18.

Figs. 12, 13, 15, and 16, from A. P. Morgan (type of G. delicatus). Fig. 14, Museum of Berlin, (type of G. Pazschkeanus). Fig. 17, Museum of Paris (type of G. floriformis). Fig. 18, from Dr. Hollós, Hungary. (Very rarely specimens show such a protruding mouth.)

GEASTER FLORIFORMIS.

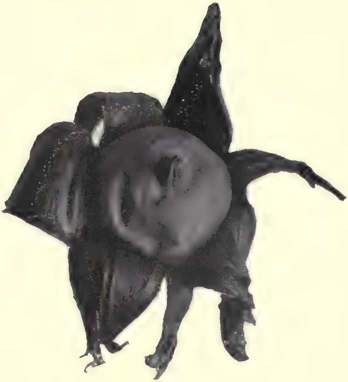

Fig. 1.

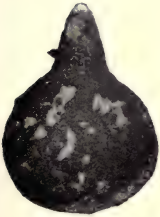

Fig. 2.

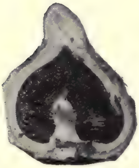

Fig. 3.

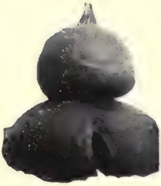

Fig. 4.

Figs. 1 and 4, expanded plants. Figs. 2 and 3, unexpanded and section. All at Cincinnati.

GEASTER ARCHERI.

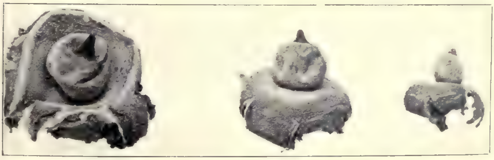

Fig. 5.

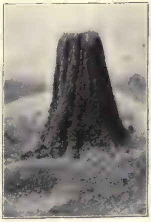

Fig. 6.

Fig. 5, specimens from Rev. Bourdot, France. Fig. 6, a mouth enlarged.

GEASTER ELEGANS.

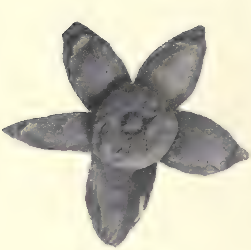

Fig. 7.

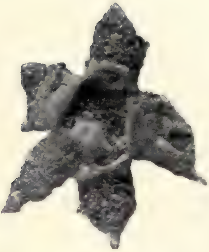

Fig. 8.

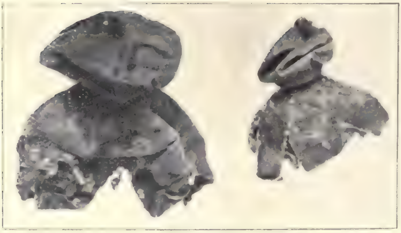

Fig. 9.

Figs. 7 and 8, type specimens in the Museum at Paris. Fig. 9, from Rev. J. Rick, Brazil.

GEASTER HARIOTII.

Issued by C. G. LLOYD.

PLATE 100.

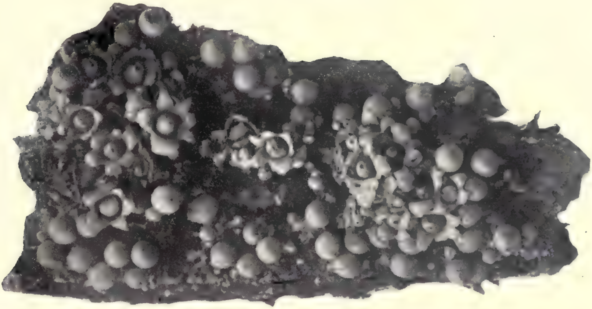

Fig. 1.

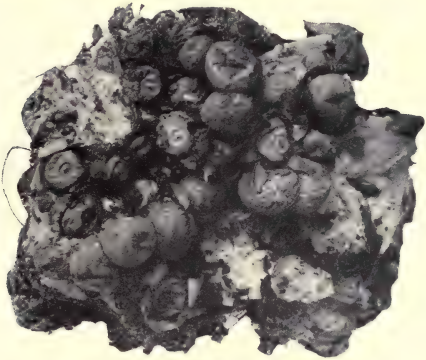

Fig. 2.

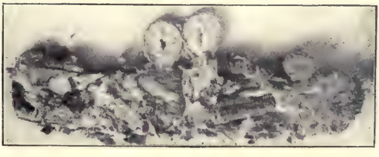

Fig. 3.

Fig. 1, photograph from fresh specimens in Samoa. Fig. 2, from Rev. J. Rick, Brazil. Fig. 3, type specimens in Museum at Paris.

GEASTER MIRABILIS.

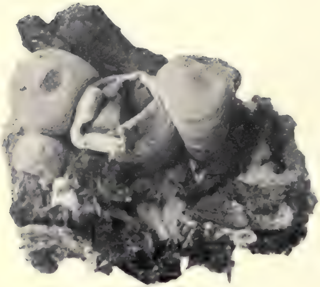

Fig. 4.

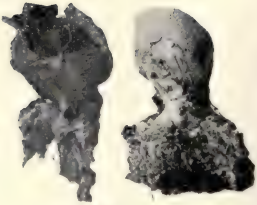

Fig. 5.

Figs. 4 and 5, from E. J. Butler, British India.

GEASTER SUBICULOSUS.

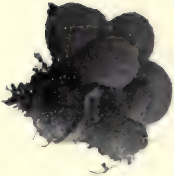

Fig. 6.

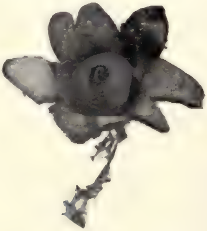

Fig. 7.

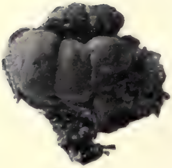

Fig. 8.

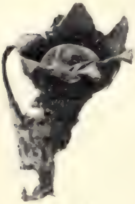

Fig. 9.

Figs. 6 and 7, types collected in Kentucky. Figs. 8 and 9, from C. H. Demetrio, Missouri.

GEASTER CAESPITOSUS.

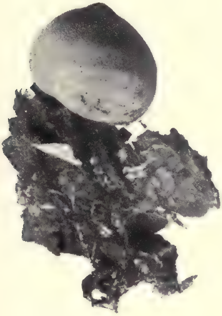

Fig. 1.

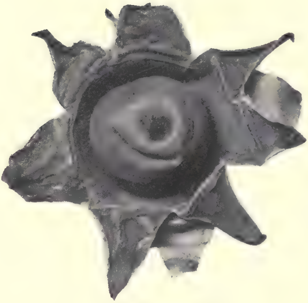

Fig. 2.

Figs. 1 and 2, unexpanded and expanded plants, Cincinnati.

GEASTER VELUTINUS.

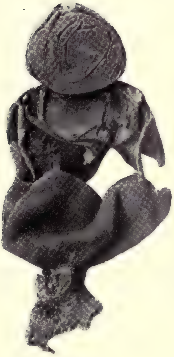

Fig. 3.

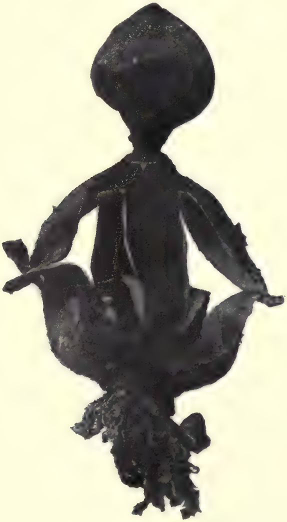

Fig. 4.

Fig. 3, type specimen at Paris. Fig. 4, specimen from Florida in herbarium, Department of Agriculture, Washington.

GEASTER WELWITSCHII.

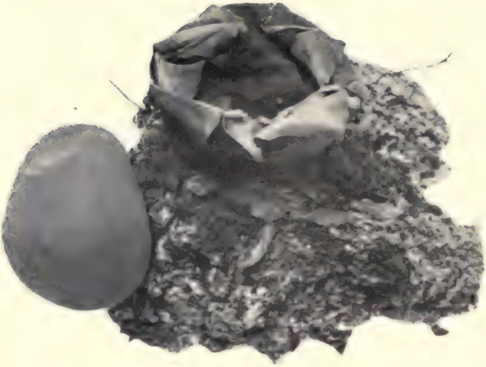

Fig. 5.

Fig. 5, specimens from Rev. J. Rick, Brazil.

GEASTER JAVANICUS.

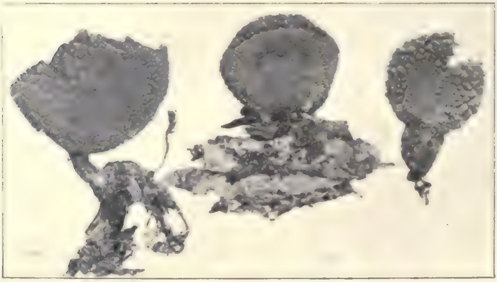

Fig. 6.

Fig. 6, type specimens in herbarium of Montagne.

GEASTER SCLERODERMA.

PLATE 102.

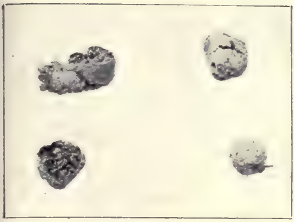

Fig. 1.

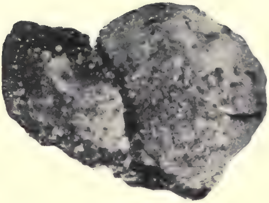

Fig. 2.

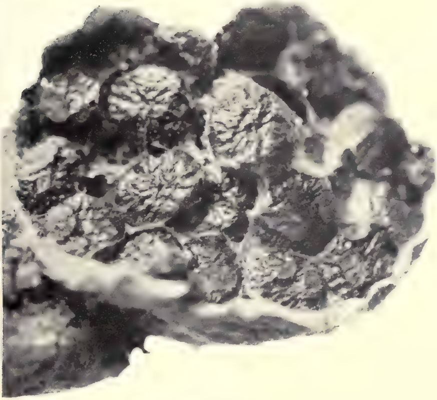

Fig. 3.

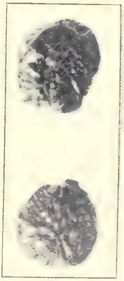

Fig. 4.

Fig. 1, natural size. Fig. 2, enlarged 4 times. Fig. 3, enlarged 10 times. Fig. 4, peridioles enlarged 10 times. All from Rev. J. Lind, Denmark.

NIDULARIA PISIFORMIS.

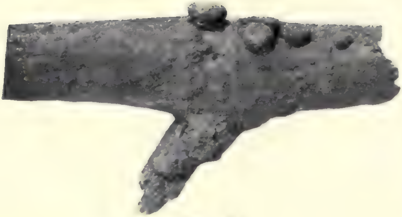

Fig. 5.

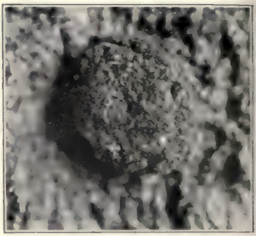

Fig. 6.

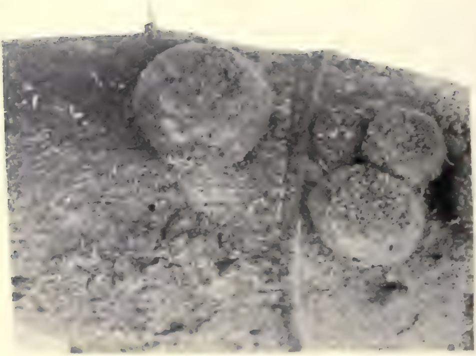

Fig. 7.

Fig. 5, natural size. Fig. 6, a young specimen, enlarged 10 times. Fig. 7, same a Fig. 5, enlarged 4 times. All from Rev. J. Rick, Brazil.

NIDULARIA PISIFORMIS.

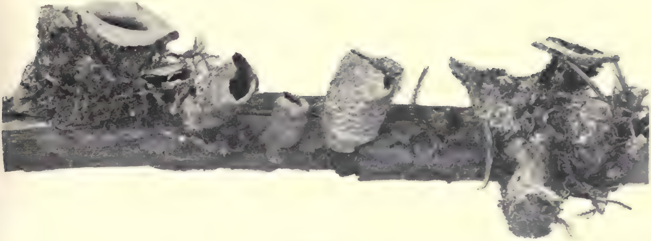

Fig. 1.

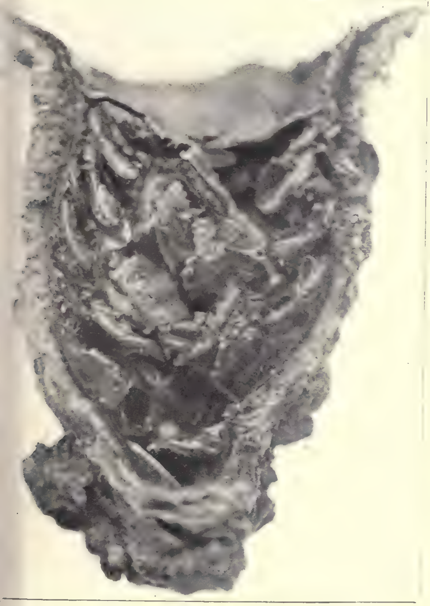

Fig. 2.

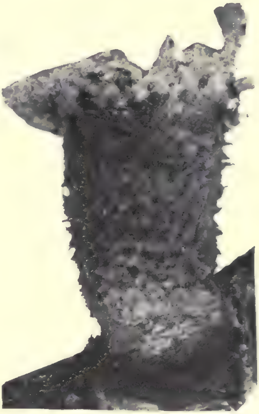

Fig. 3.

Fig. 1, plants natural size. Fig. 2, a young specimen, section enlarged 10 times. Fig. 3, ecimen enlarged 4 times. All from Albert J. Hill, Canada.

NIDULA CANDIDA.

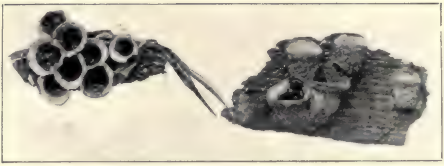

Fig. 4.

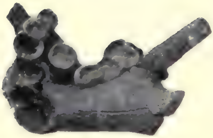

Fig. 5.

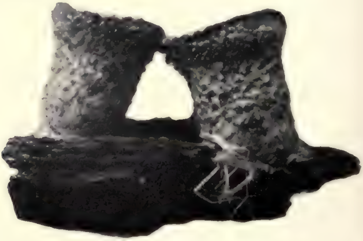

Fig. 6.

Fig. 4, specimens from Albert J. Hill, Canada. Fig. 5, young specimens from C. V. Piper, Washington. Fig. 6, specimens enlarged four times.

NIDULA MICROCARPA.

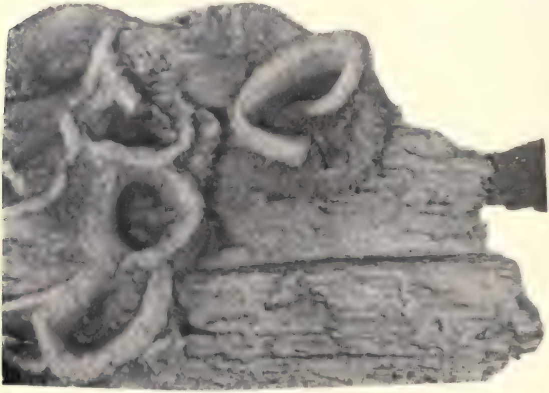

Fig. 7.

Fig. 7, type specimens (enlarged 4 times) at Kew.

NIDULA EMODENSIS.

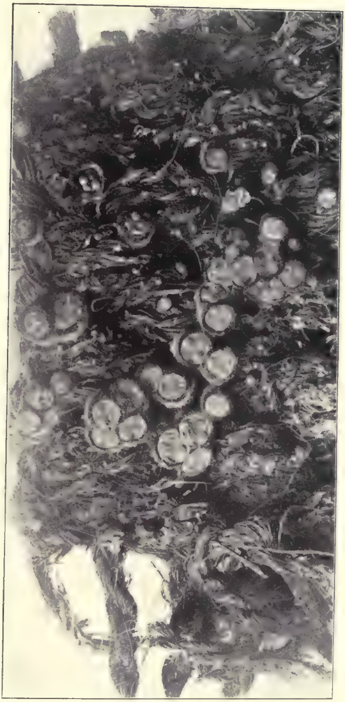

Fig. 1.

Fig. 1, growing on an old mat. (Most of these have the epiphragms unbroken.)

CRUCIBULUM VULGARE.

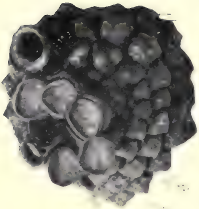

Fig. 2.

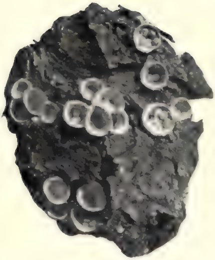

Fig. 3.

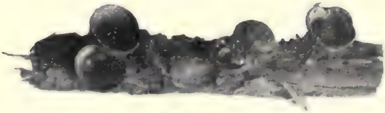

Fig. 4.

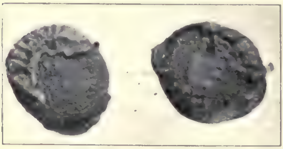

Fig. 5.

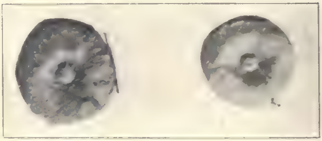

Fig. 6.

Fig. 7.

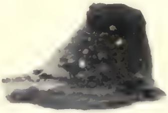

Fig. 8.

Fig. 2, growing on pine cone. Fig. 3, a small form on manure. Specimens from C. E. Montgomery, New Hampshire. Fig. 4, growing on a stick. Fig. 5, peridioles enlarged (10) showing the broken tunica. Fig. 6, same, (under side) showing the "nipple." Fig. 7, section of peridiole enlarged (15). Fig. 8, a very young specimen enlarged (10).

CRUCIBULUM VULGARE.

PLATE 105.

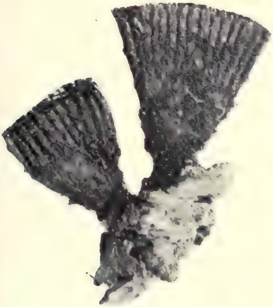

Fig. 1.

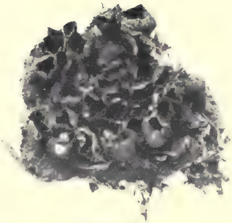

Fig. 2.

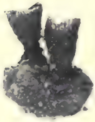

Fig. 3.

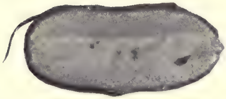

Fig. 4.

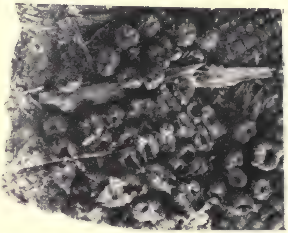

Fig. 5.

Fig. 1, type specimen, Herbarium Tulasne, enlarged 4 times. Fig. 2, specimens from Chas. A. O'Connor, Mauritius. Fig. 3, from Dr. K. Braun, German East Africa. Fig. 5, C. G. Lloyd, Samoa (on old mat). Fig. 4, section peridiole enlarged 15 times.

CYATHUS POEPPIGII.

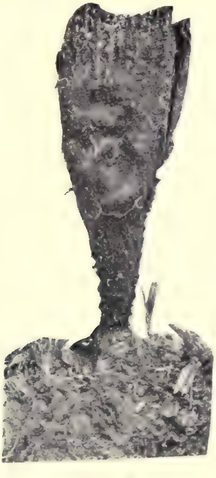

Fig. 6.

Fig. 6, type specimens, Herbarium Tulasne, enlarged 4 times.

CYATHUS GAYANUS.

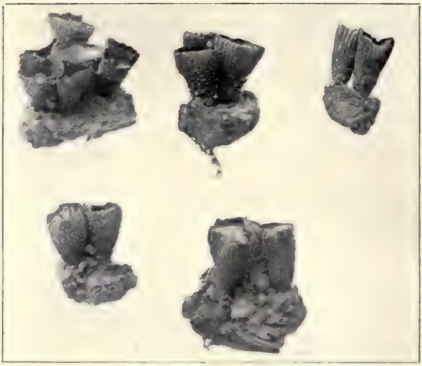

Fig. 7.

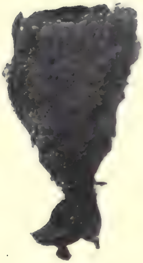

Fig. 8.

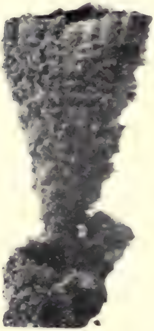

Fig. 9.

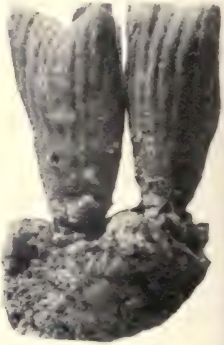

Fig. 10

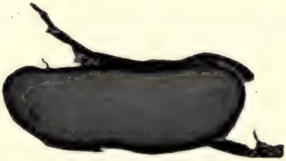

Fig. 11.

Fig. 7, specimens from William Harris, Jamaica. Fig. 8, type in Herbarium Montagne (enlarged 4 times). Fig. 9, a young hirsute specimen (enlarged 4 times). Fig. 10, old striate specimens (enlarged 4 times). Fig. 11, section peridiole (enlarged 15 times).

CYATHUS LIMBATUS.

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PLATE 106.

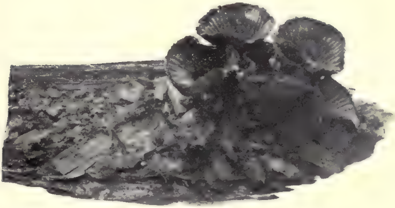
Fig. 1.

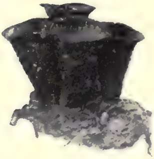
Fig. 2.

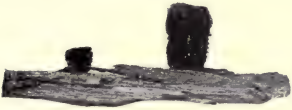
Fig. 3.

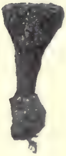
Fig. 4.

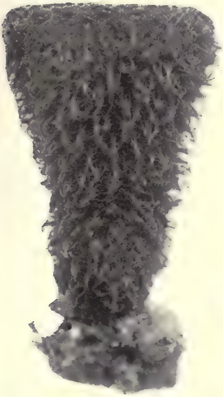
Fig. 5.

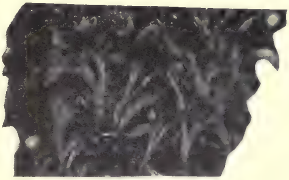
Fig. 6.

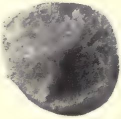
Fig. 7.

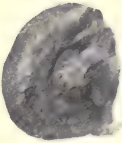
Fig. 8.

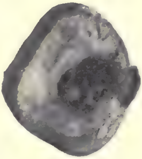
Fig. 9.

Fig. 1, plants from L. Romell, Sweden. Fig. 2, from J. Lagarde, France. Figs. 3 and 4, from Rev. C. Torrend, Spain. Fig. 5, cup enlarged 4 times. Fig. 6, external hairs enlarged 10 times. Figs. 7, 8, and 9, peridioles enlarged 10 times, the latter soaked in water to swell the tunica.

CYATHUS STRIATUS.

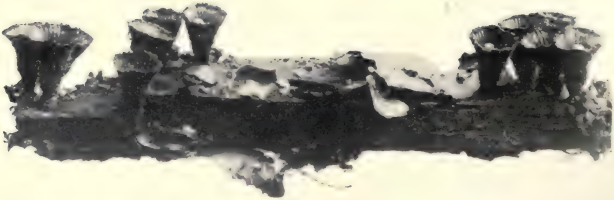

Fig. 10.

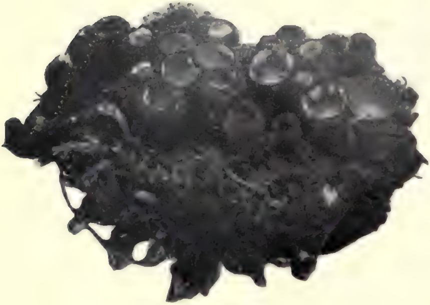

Fig. 11.

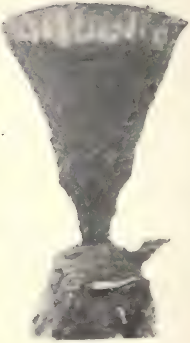

Fig. 12.

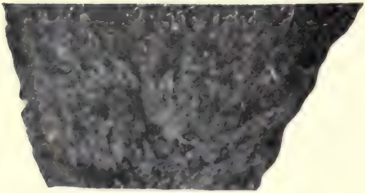

Fig. 13.

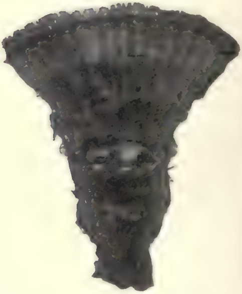

Fig. 14.

Figs. 10 and 11, specimens at Cincinnati. Fig. 12, cup enlarged 4 times. Fig. 13, external hairs enlarged 10 times. Fig. 14, enlarged, half the outer cup removed to show the peridioles in the inner cup at base.

CYATHUS SCHWEINITZII.

PLATE 107.

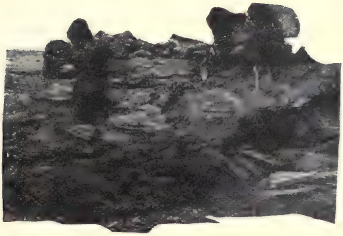

Fig. 1.

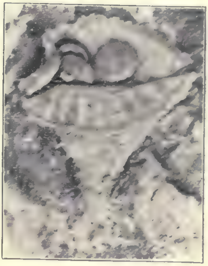

Fig. 2.

Fig. 3.

Fig. 1, specimens from Rev. J. Rick, Brazil. Fig. 2, type specimen (enlarged 4 times) in Herbarium Montagne. Fig. 3, section peridiole (enlarged 15 times)

CYATHUS MONTAGNEI.

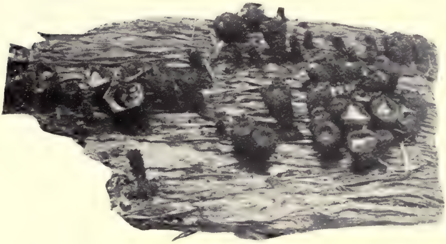

Fig. 4.

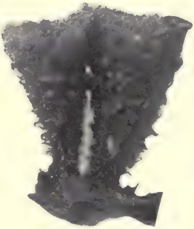

Fig. 5.

Fig. 4, specimens collected in Samoa. Fig. 5, enlarged 4 times.

CYATHUS NIGRO-ALBUS.

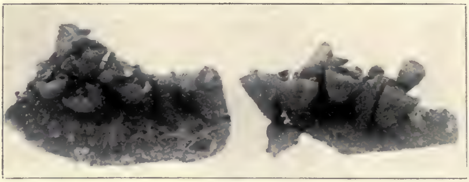

Fig. 6.

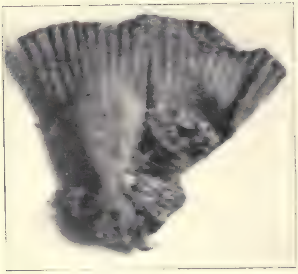

Fig. 7.

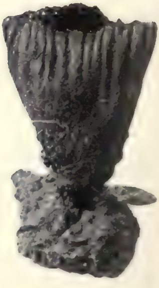

Fig. 8.

Fig. 6, specimens from H. Millen, Tobago. Fig. 7, type at Kew (enlarged 4 times). Fig. 8, a specimen from H. Millen (enlarged 4 times).

CYATHUS BERKELEYANUS.

PLATE 108.

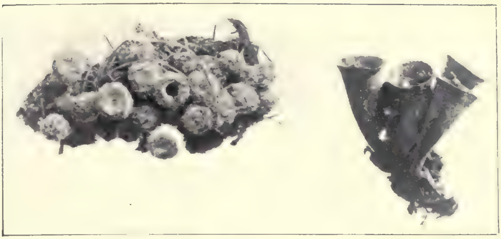

Fig. 1.

Fig. 4.

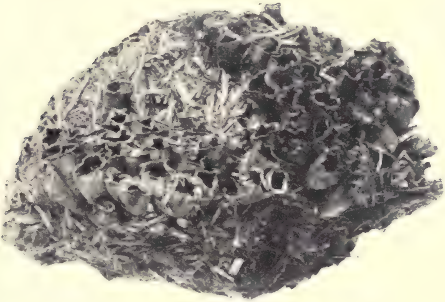

Fig. 2.

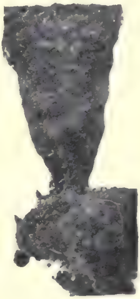

Fig. 5.

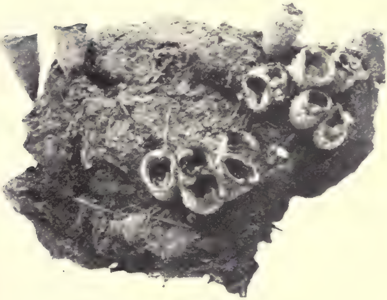

Fig. 3

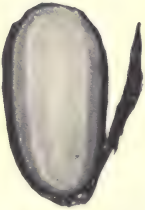

Fig. 6.

Fig. 1, from Cincinnati. Fig. 2, from C. E. Montgomery, New Hampshire. Fig. 3, from W. C. Dawson, Ohio. Fig. 4 (enlarged 4 times), from M. Bezzi, Italy. Fig. 5 (enlarged 4 times), from Cincinnati. Fig. 6, section peridiole (enlarged 15 times).

CYATHUS STERCOREUS.

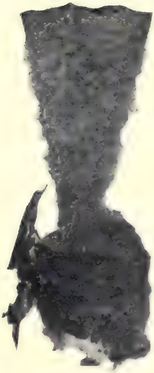

Fig. 7.

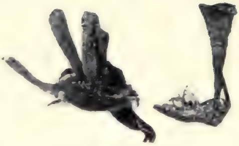

Fig. 8.

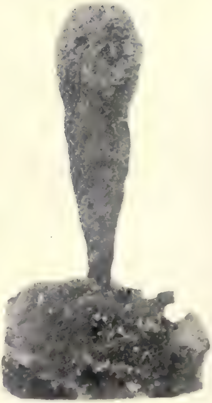

Fig. 9.

Fig. 7, type (enlarged 4 times) from E. Bartholomew, Kansas. Fig. 8, specimens from C. E. Pleas, Florida. Fig. 9, same, young, (enlarged 4 times) to show mycelial pad at base.

CYATHUS RUFIPES.

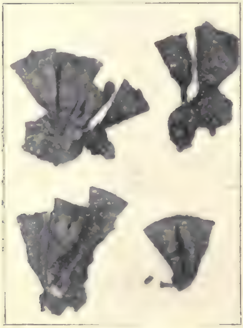

Fig. 10.

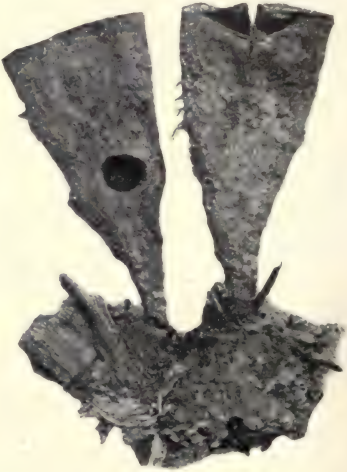

Fig. 11.

Fig. 10, types in Herbarium Tulasne. Fig. 11 same (enlarged 4 times).

CYATHUS LESUEURII.

PLATE 109.

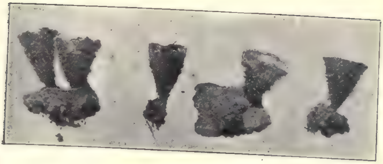

Fig. 1.

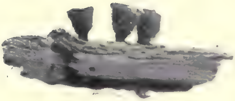

Fig. 3.

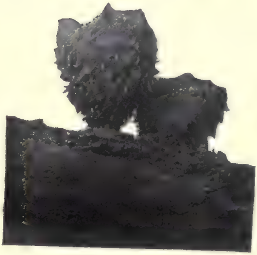

Fig. 4

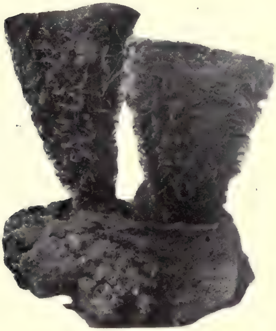

Fig. 2.

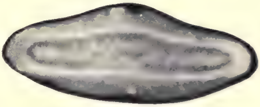

Fig. 5.

Fig. 1, specimens from A. Thibou, Antigua. Fig. 2, same, enlarged 4 times. Fig. 3, a small form from Miss Barrett, Jamaica. Fig. 4, same, enlarged 4 times. Fig. 5, section peridiole, enlarged 15 times.

CYATHUS PALLIDUS.

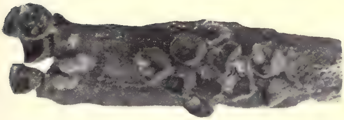

Fig. 6.

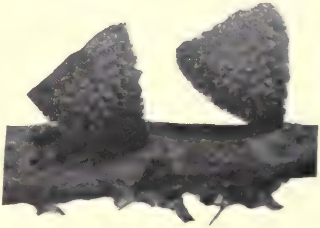

Fig. 7.

Fig. 6, specimens from W. Jekyll, Jamaica. Fig. 7, same, enlarged 4 times.

CYATHUS SPHAEROSPORUS.

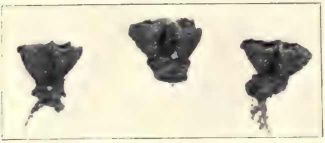

Fig. 8.

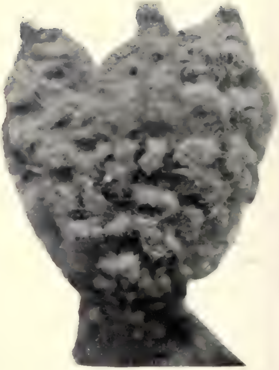

Fig. 11.

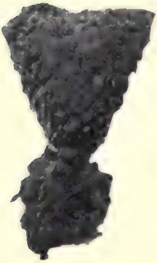

Fig. 9.

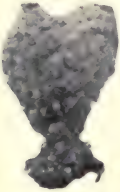

Fig. 10.

Fig. 8, specimens from F. S. Earle, Cuba. Fig. 9, type specimen (X 4) from Montagne's Herbarium. Fig. 10, specimen from F. S. Earle, enlarged 4 times. Fig. 11, a young specimen enlarged 10 times.

CYATHUS INTERMEDIUS.

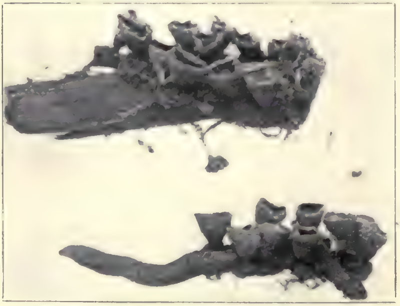

Fig. 12.

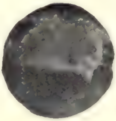

Fig. 13.

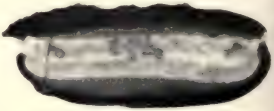

Fig. 14.

Fig. 12, specimens from Charles A. O'Connor, Mauritius. Fig. 13, a peridiole enlarged 10 times, showing fragment of tunica. Fig. 14, section (X 15).

CYATHUS TRIPLEX.

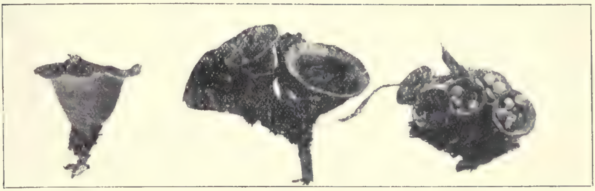

Fig. 1.

Fig. 2.

Fig. 3.

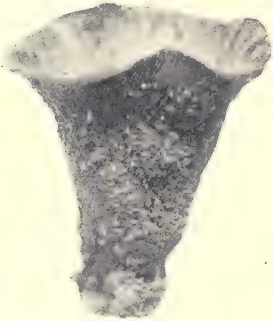

Fig. 4

Fig. 1, specimens from Cincinnati. Fig. 2, upper side, and Fig. 3, lower side of peridiole enlarged 10 times. Fig. 4, cup enlarged 4 times.

CYATHUS VERNICOSUS.

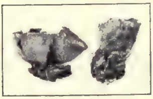

Fig. 5.

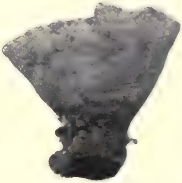

Fig. 6.

Fig. 5, specimens from F. M. Reader, Australia. Fig. 6, same enlarged 4 times.

CYATHUS COLENSOI.

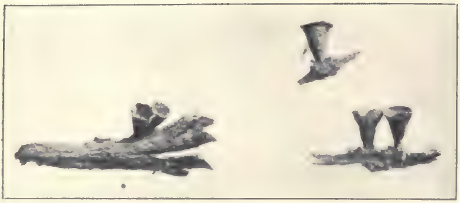

Fig. 7.

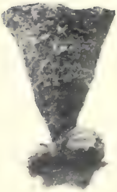

Fig. 8.

Fig. 7, specimens from C. V. Piper, Washington. Fig. 8, same enlarged 4 times.

CYATHUS PYGMAEUS.

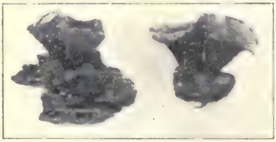

Fig. 9.

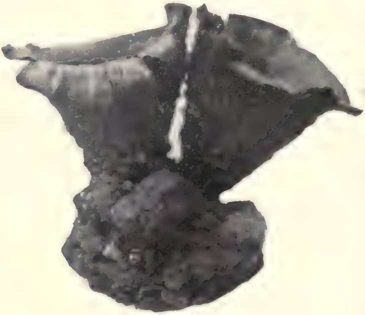

Fig. 10.

Fig. 9, specimens from F. S. Earle, Cuba. Fig. 10, same enlarged 4 times.

CYATHUS EARLEI.

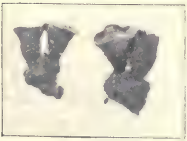

Fig. 11.

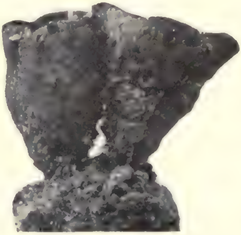

Fig. 12.

Fig. 11, specimens from L. Lewton-Brain, Barbados. Fig. 12, same enlarged 4 times.

CYATHUS CANNA.

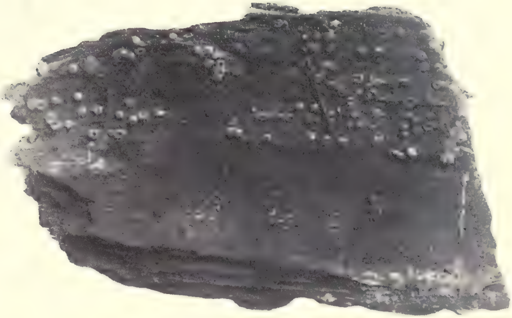

Fig. 1.

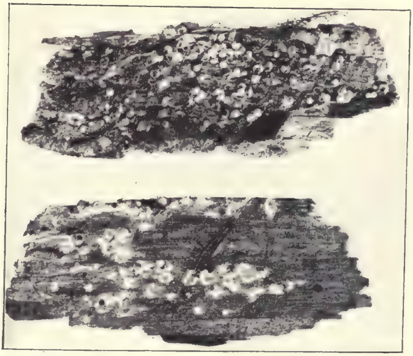

Fig. 2.

Fig. 1, fresh specimens from L. Romell, Sweden. Fig. 2, dried specimens from Otto Jaap, Germany.

SPHAEROBOLUS STELLATUS.

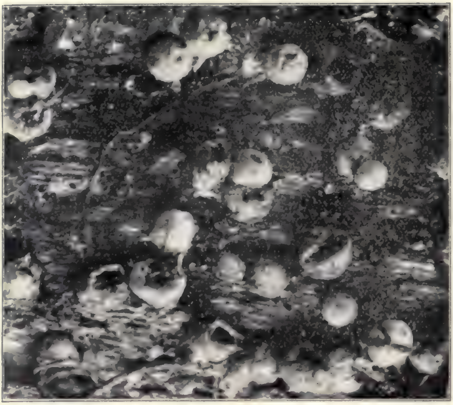

Fig. 3.

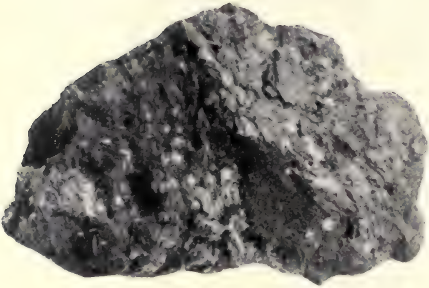

Fig. 4.

Fig. 3, specimens enlarged 6 times, from Otto Jaap, Germany. Fig. 4, dried specimen on manure, from Rev. Langlois, Louisiana.

SPHAEROBOLUS STELLATUS.

Issued by C. G. LLOYD.

PLATE 112.

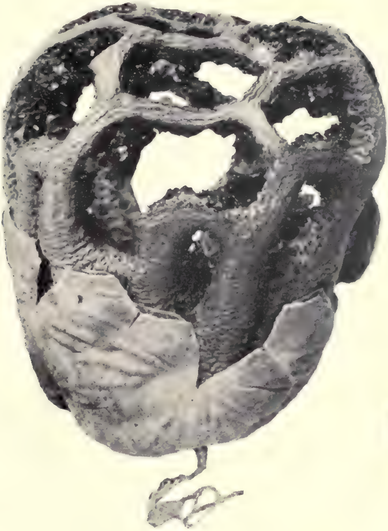

Fig. 1.

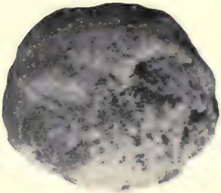

Fig. 2.

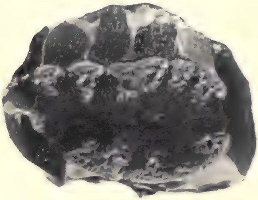

Fig. 3.

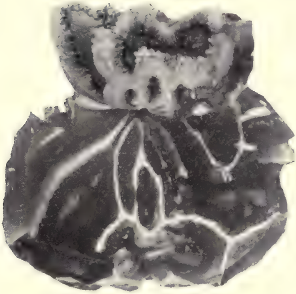

Fig. 5.

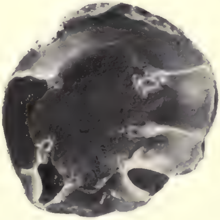

Fig. 4

Fig. 1, photograph of a fresh specimen from Auguste Bernin, Monaco. Fig. 2, an egg. Figs. 3 and 4, sections of an egg. Fig. 5, section of an egg with the volva pulled away.

CLATHRUS CANCELLATUS.

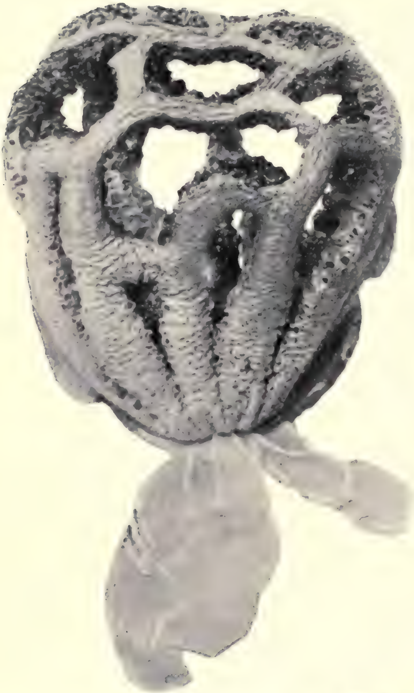

Fig. 6.

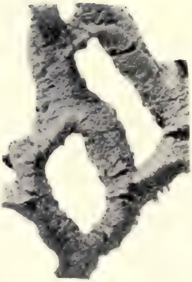

Fig. 7.

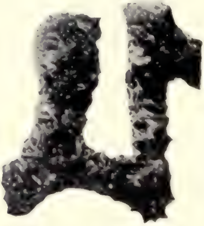

Fig. 8.

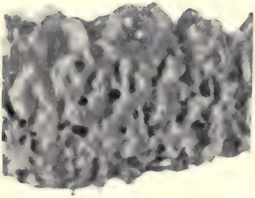

Fig. 9.

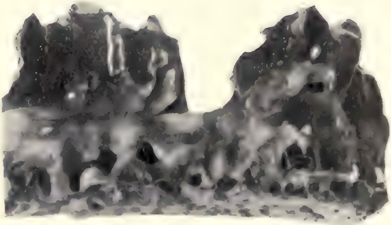

Fig. 10.

Fig. 6, a plant with the volva pulled away. Fig. 7, outer view of the arms. Fig. 8, inner view of the arms. Fig. 9, outer view of arm enlarged 4 times. Fig. 10, side view enlarged 4 times.

CLATHRUS CANCELLATUS.

PLATE 113.

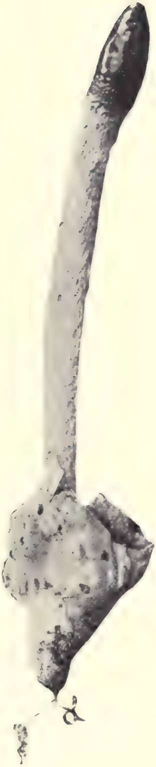

Fig. 1.

Fig. 2.

Fig. 3.

Photograph by W. Krieger, Saxony, Germany.

MUTINUS CANINUS.

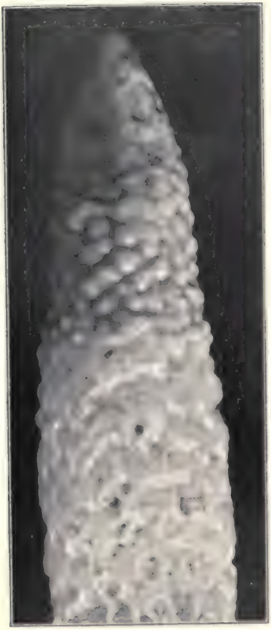

Fig. 4.

Fig. 4, the top of an alcoholic specimen (in museum at Paris) enlarged 4 times.

MUTINUS CANINUS.

PLATE 114.

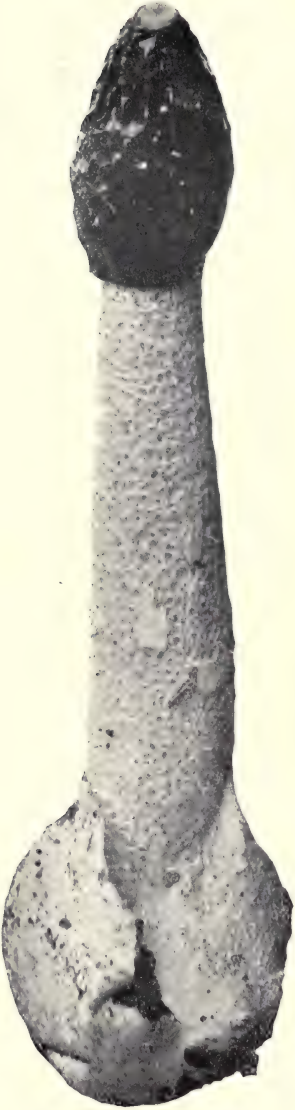

Fig. 1.

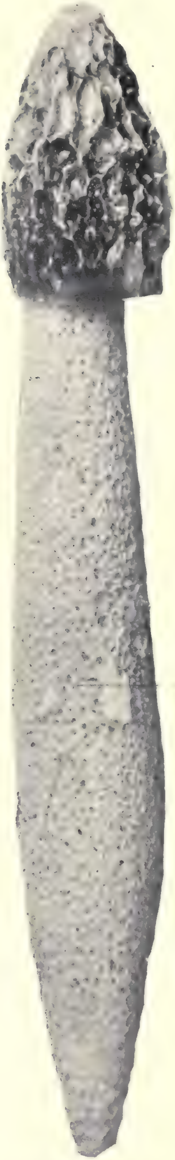

Fig. 2.

Fig. 1, fresh specimen photographed in France. Fig. 2, same devoid of volva.

PHALLUS IMPUDICUS.

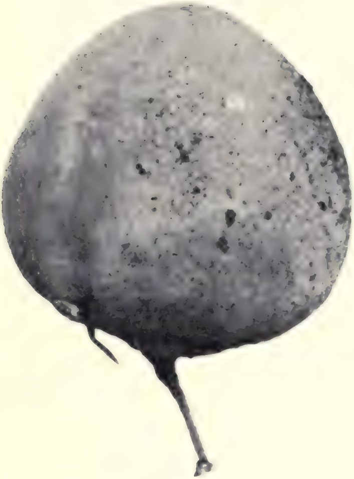

Fig. 3.

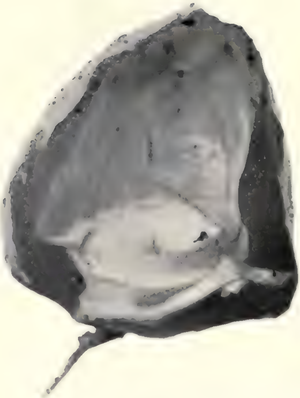

Fig. 4.

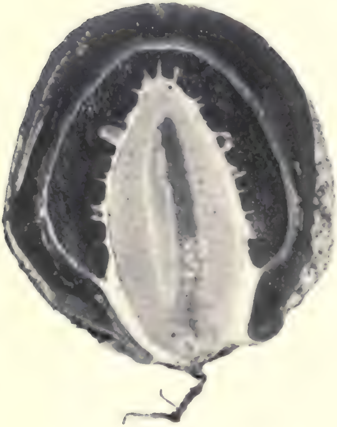

Fig. 5.

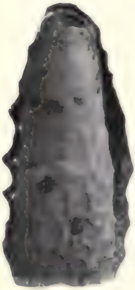

Fig. 6.

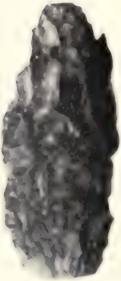

Fig. 7.

Fig. 3, an egg. Fig. 4, section of the volva to show the inner cup. Fig. 5, section of egg. Fig. 6, the inner face of the pileus. Fig. 7, the outer face (the gleba washed away).

PHALLUS IMPUDICUS.

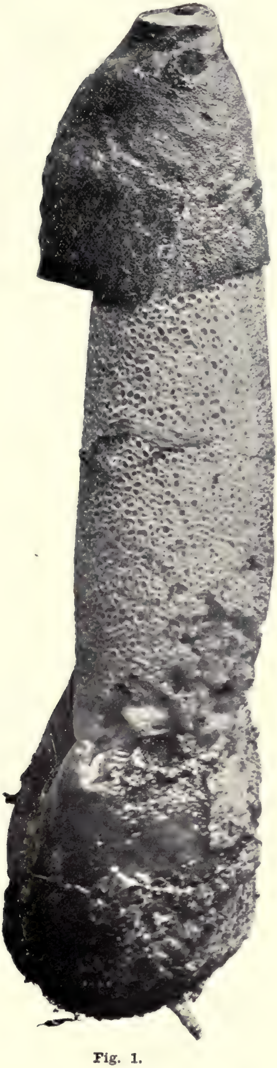

Fig. 1.

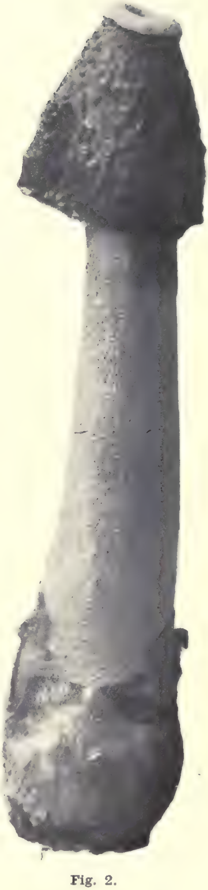

Fig. 2.

Fresh specimens photographed at Cincinnati.

PHALLUS RAVENELII.

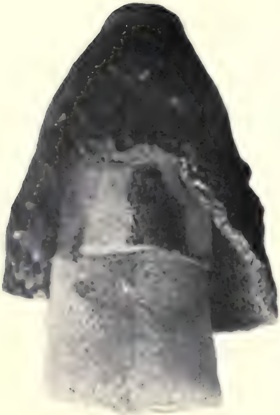

Fig. 3.

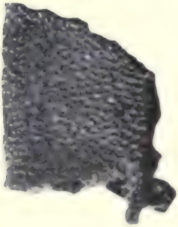

Fig. 4.

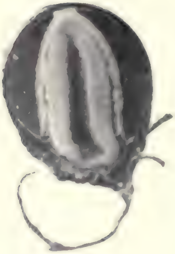

Fig. 5.

Fig. 3, a pileus with part removed to show the veil. Fig. 4, under surface of the pileus. Fig. 5, section of an egg.

PHALLUS RAVENELII.

Issued by C. G. LLOYD.

PLATE 116.

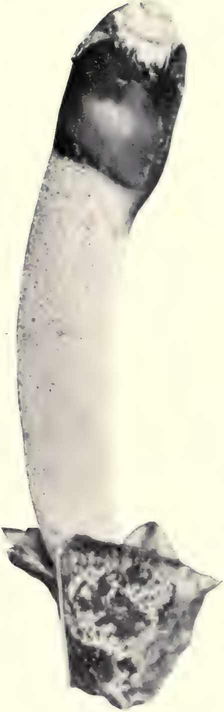

Fig. 1.

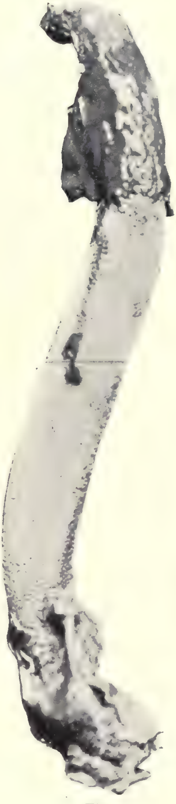

Fig. 2.

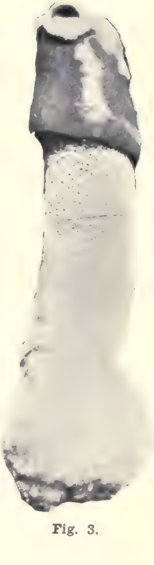

Fig. 3.

Photograph by W. H. Long, Jr., Texas.

PHALLUS RUBICUNDUS.

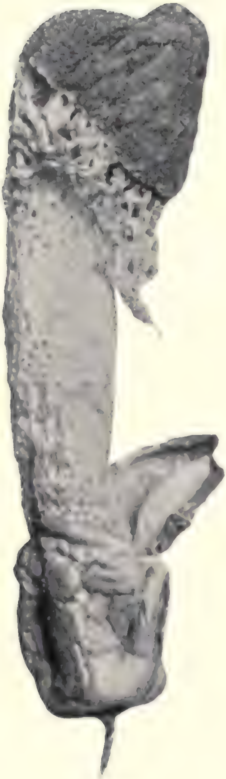

Fig. 4.

Photograph of the type specimen, given me by Professor Patouillard.

PHALLUS IRPICINUS.

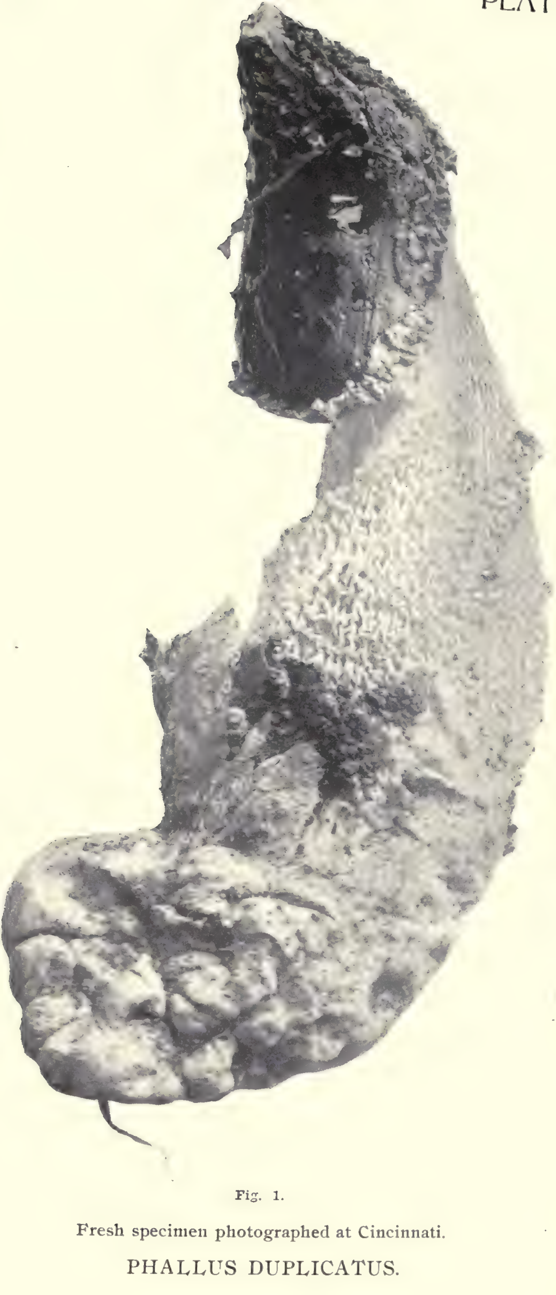

Fig. 1.

Fresh specimen photographed at Cincinnati.

PHALLUS DUPLICATUS.

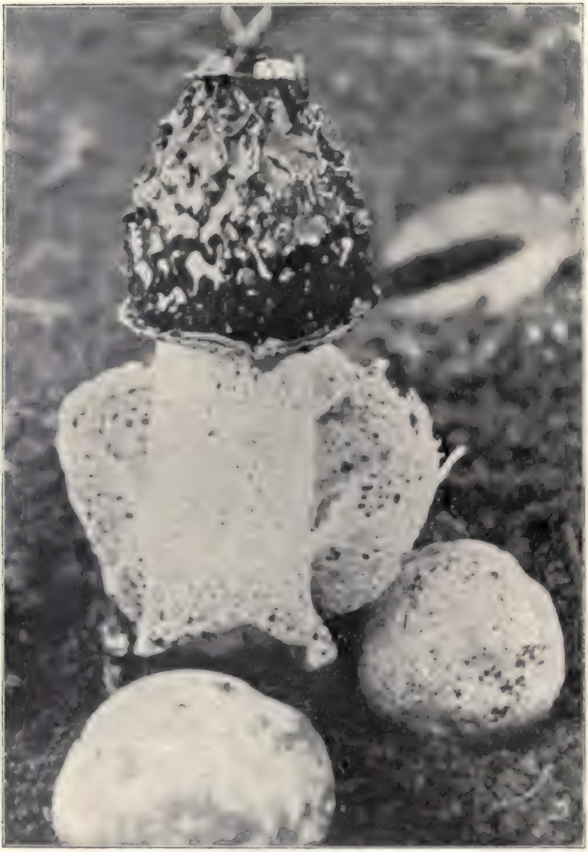

Fig. 2.

Photographed by C. E. Pleas, Florida.

PHALLUS DUPLICATUS.

Issued by C. G. LLOYD.

PLATE 118.

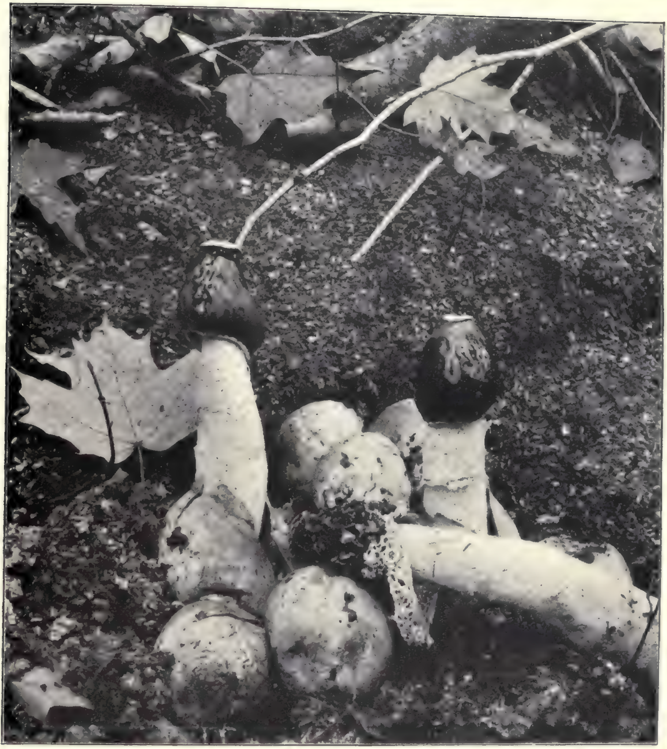

Fig. 1.

Photograph by Professor H. C. Beardslee, Cleveland, O. The photo is reduced and is a little less than one half the natural size.

PHALLUS DUPLICATUS.

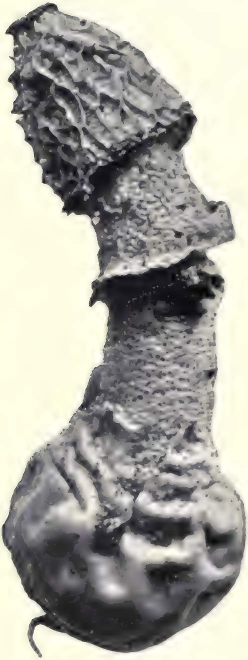

Fig. 2.

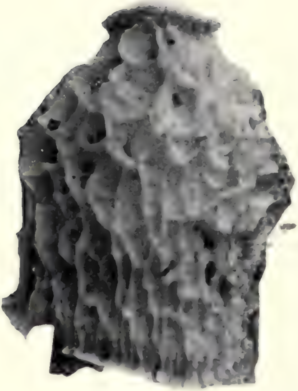

Fig. 3.

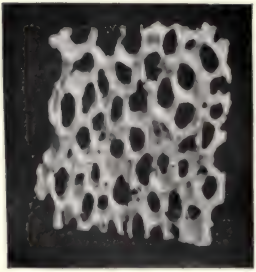

Fig. 4.

Fig. 2, photograph from a specimen in alcohol, the veil contracted and shriveled. Fig. 3, pileus with the gleba washed away. Fig. 4, a piece of the veil.

PHALLUS DUPLICATUS.

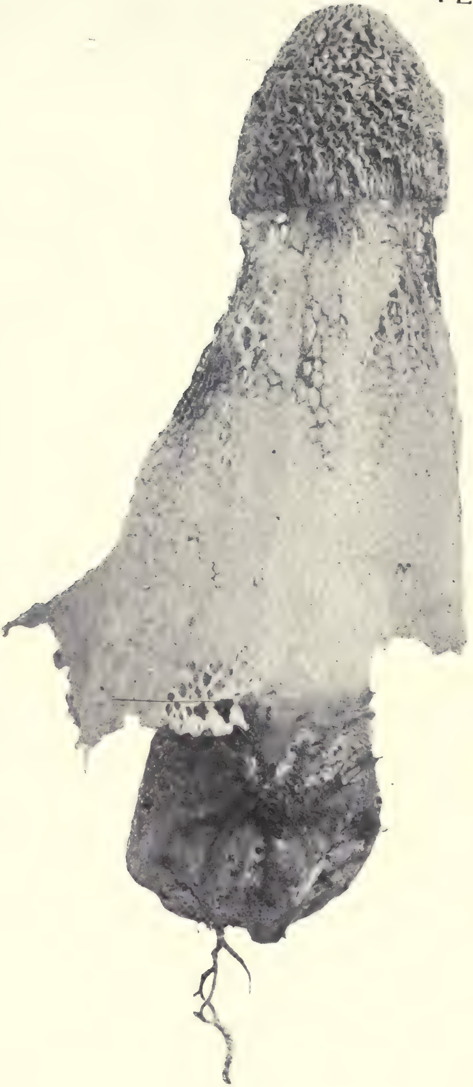

Fig. 1.

Fresh specimen photographed in Samoa.

PHALLUS INDUSIATUS.

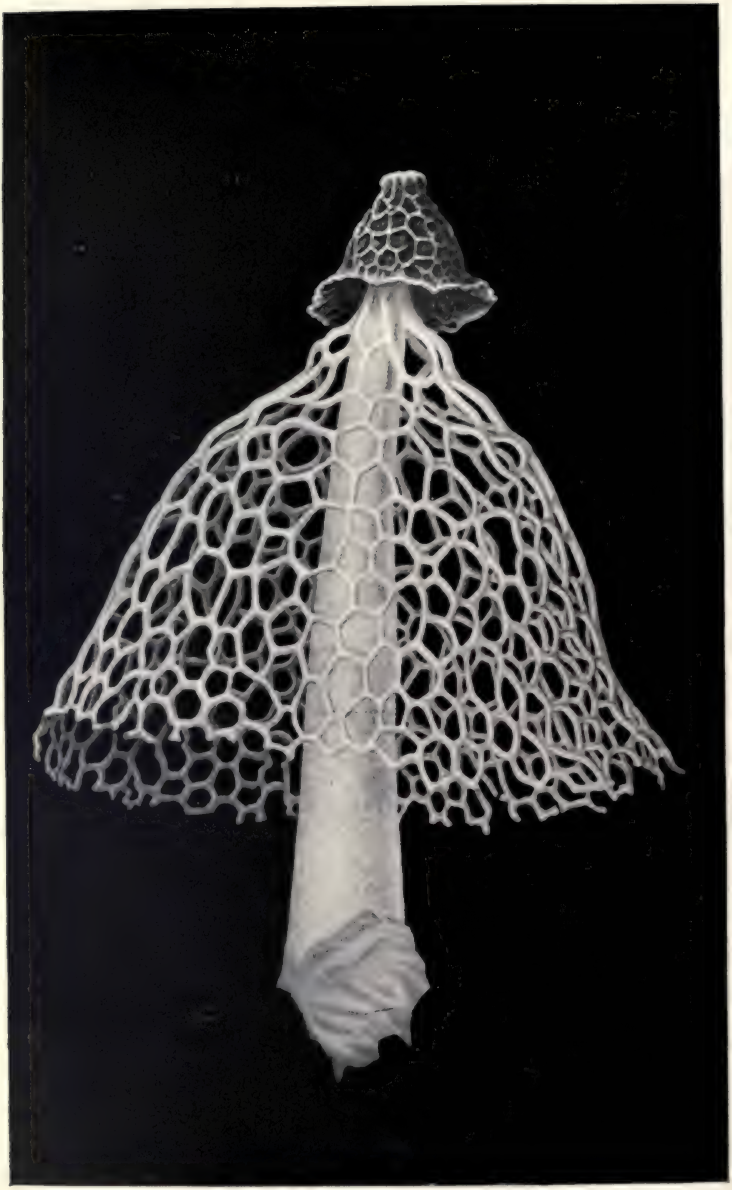

Fig. 2.

Copied from the Brasilische Pilzblumen by Alfred Möller.

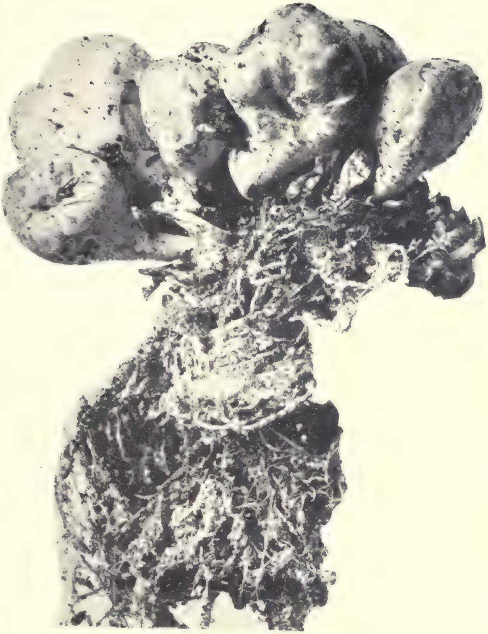

Fig. 1.

A cluster of young plants, photographed at Cincinnati.

PHALLOGASTER SACCATUS.

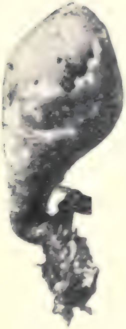

Fig. 2.

Fig. 3.

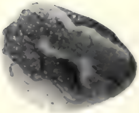

Fig. 4.

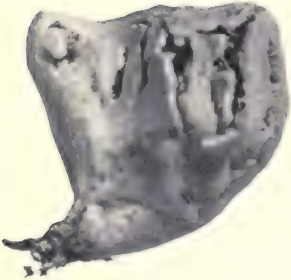

Fig. 5.

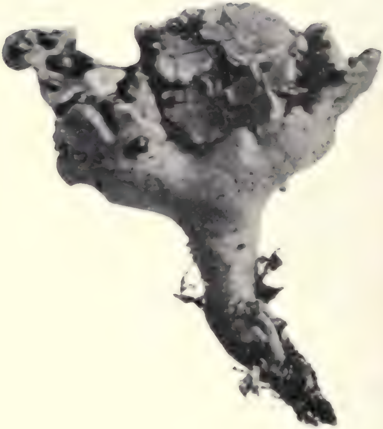

Fig. 6.

Fig. 2, an unopened specimen. Fig. 3, same, section. Fig. 4, transverse section. Fig. 5, a specimen just beginning to break. Fig. 6, a specimen after dehiscence. All photographed fresh at Cincinnati.

PHALLOGASTER SACCATUS.

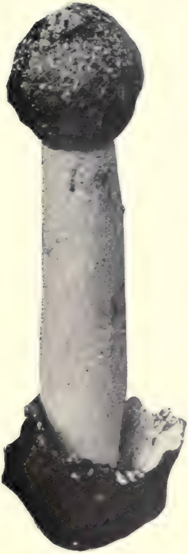

Fig. 1.

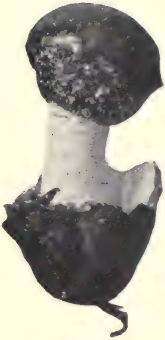

Fig. 2.

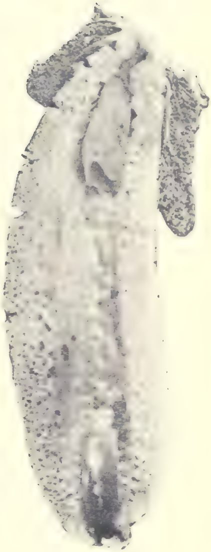

Fig. 3.

Figs. 1 and 2, photographs by Rev. Père A. Schupp, Brazil. Fig. 3, section of plant, from "Brasilische Pilzblumen" by Alfred Möller.

ITAJAHYA GALERICULATA.

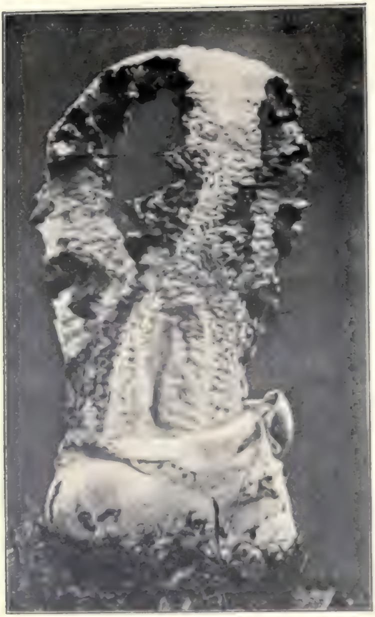

Fig. 4.

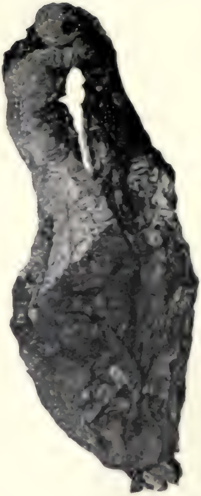

Fig. 5.

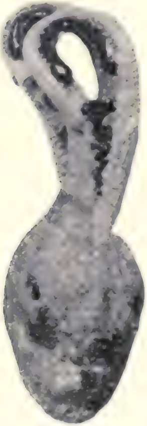

Fig. 6.

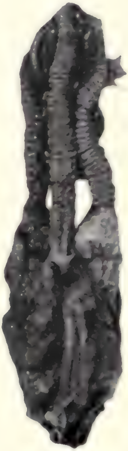

Fig. 7.

Fig. 4, from "Brasilische Pilzblumen" by Alfred Möller. Figs. 5 and 7, photographs of dried specimens from Father J. Rick, Brazil. Fig. 6, photograph of a fresh plant by Father Rick.

BLUMENAVIA RHACODES.

Issued by C. G. LLOYD.

PLATE 122.

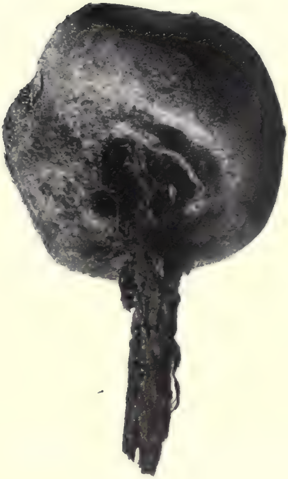
Fig. 1.

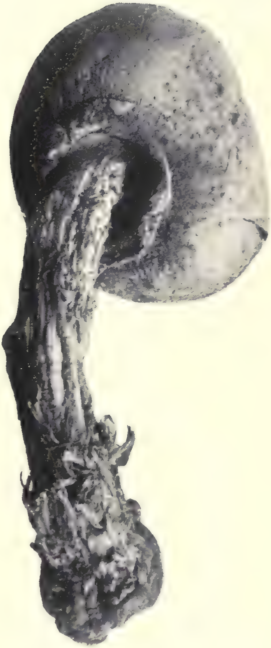
Fig. 2.

Fig. 1, specimen from Dr. Wm. Herbst, Trexlertown, Pa. Fig. 2, specimen in museum at Paris, collected by A. Le Breton, France.

QUELETIA MIRABILIS.

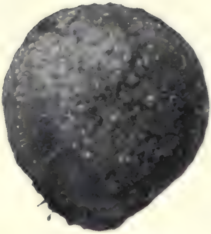

Fig. 3.

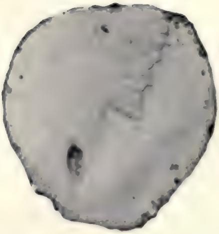

Fig. 4.

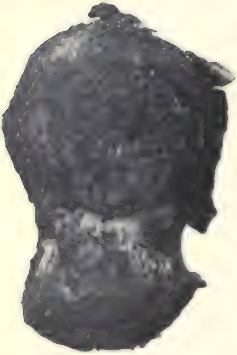

Fig. 5

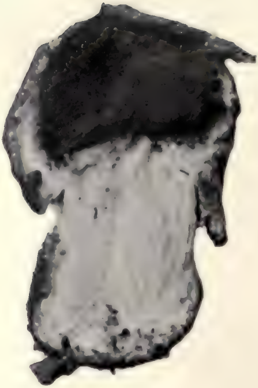

Fig. 6.

Fig. 3, a young specimen. Fig. 4, section of same. Fig. 5, a young specimen after the stem has begun to grow and the gleba has ripened. Fig. 6, section of same. All from Victor Dupain, France.

QUELETIA MIRABILIS.

PLATE 123.

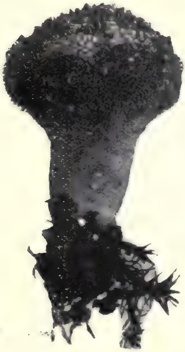

Fig. 1.

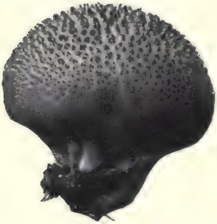

Fig. 2.

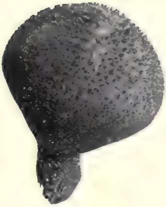

Fig. 3.

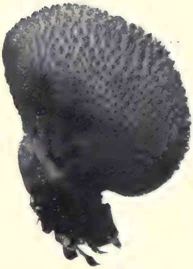

Fig. 4

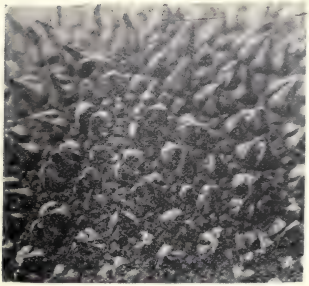

Fig. 5.

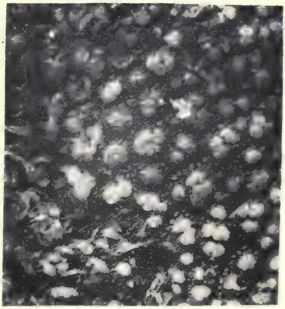

Fig. 6.

Figs. 1, 2, 3, 4, fresh specimens photographed in Sweden. Fig. 5, cortex enlarged 4 times. Fig. 6, same after the spines have fallen.

LYCOPERDON NIGRESCENS.

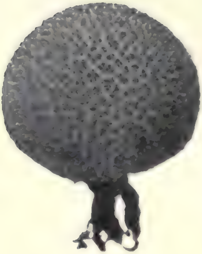

Fig. 7.

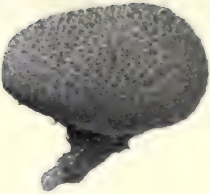

Fig. 8.

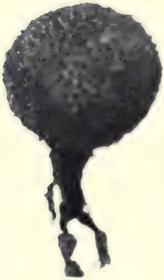

Fig. 9.

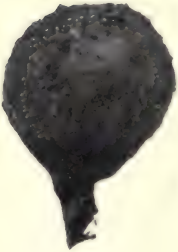

Fig. 10.

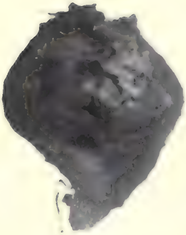

Fig. 11.

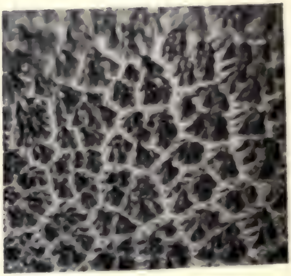

Fig. 12.

Figs. 7 and 8, fresh plants with cortex. Figs. 9 and 10, same as the cortex begins to shrivel. Fig. 11, same after the fall of the cortex. Fig. 12, cortex enlarged 4 times. All photographed at Barbizon, France.

LYCOPERDON ATROPURPUREUM.

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